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ABSTRACT

In this study, North Carolina Community College System (NCCCS) graduates from 1986-1987 were examined 10 years after graduation to see if they had gained additional education and salary. The study's primary purpose was to address the accountability of community college co-op education. Within the study, the term, co-op refers to an educational program integrating classroom studies with paid, productive work experiences related to a student's academic or career goals. A total of 674 surveys were sent out and 259 were returned, yielding a 38% response rate. The respondents were divided into three groups: (1) co-op graduates from a college offering cooperative education; (2) non co-op graduates from a college offering cooperative education; and (3) non-co-op graduates from a college not offering cooperative education. The study found no significant differences among the three groups in terms of their completion rates of additional education in latter years. Moreover, the proportion of graduates who indicated that their employers required them to complete additional education to receive a salary increase was also nearly equal among all three groups. Overall, the study showed that participation in co-op education had little effect on the rate of additional education or salary increase. The investigator suggested the need for further research on this topic and possibly development of new co-op education models. (Contains 158 references.) (GC)

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FOLLOW-UP OF NORTH CAROLINA COMMUNITY COLLEGE COOPERATIVE EDUCATION GRADUATES: ADDITIONAL EDUCATION AND SALARY GAINS

by

LILLIAN RIGGS JOHNSON

A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Doctor of Education

ADULT AND COMMUNITY EDUCATION

Raleigh

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ABSTRACT

JOHNSON, LILLIAN RIGGS. Follow-up of North Carolina Community College Cooperative Education Graduates: Additional Education and Salary Gains (Under the direction of George A. Baker III and Wynetta Y. Lee.)

In this study, North Carolina Community College System (NCCCS) graduates from 1986-1987 were examined 10 years later to see if they had achieved additional education and salary gains. Wessels and Pumphrey, along with the Center for Urban Affairs and Community Services, surveyed the graduates in 1993 and 1995. Using stratified random sampling, the researchers divided the sample into three strata: group 1–co-op graduates from a college offering co-op education, group 2–non co-op graduates from a college offering co-op education, and group 3–non co-op graduates from a college not offering co-op education.

The study's purpose was to (a) address accountability of community college co-op education, (b) determine the extent to which these co-op graduates had obtained additional education and salary gains, (c) provide the NCCCS with outcome data for 1987 co-op and non co-op graduates at least 10 years after graduation, (d) report the proportion of 1987 graduates who had obtained a bachelor's or higher degree since graduating, and (e) provide long-term salary data for the 1987 graduates.

A survey that addressed additional education, employment, co-op education experiences, and demographics was mailed to graduates who had received associates degrees in applied science. Out of 674 surveys mailed, 259 surveys were returned (only 241 were used in analyses), for a 38% response rate.

Contrary to what was hypothesized, no differences were found in the proportion of graduates who had completed additional education when comparing group 1 to groups

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2 or 3 (87.6% had completed training, 24.5% were pursuing work-related additional education at the time of the study, and 23.2% had received bachelor's degrees or higher). Moreover, the proportion of graduates who indicated their employers required them to complete additional education to receive a salary increase was nearly equal among all three groups ($\underline{M}$ = 21.6%).

From this study's findings, the graduates' participation in co-op education had little effect on obtaining additional education or salary increases 10 years after graduating. These findings support the need for new research and, perhaps, new co-op education models. Proposed models in this study might address the needs of the non-traditional student more effectively.

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CHAPTER ONE

INTRODUCTION

Overview of Cooperative Education in Community Colleges

Introduction to Problem and Reason for Study

Addressing the needs of community college cooperative education for the 21st century requires examining the system from its beginnings to its present state. Now more than ever, employers are calling for workers with high (multiple) skills and are willing to pay high wages for such workers. Hutcheson (1995) reported "more employers are emphasizing the importance of previous work experience or work-based learning for the graduates they will hire" (p. 77). Educators and administrators want to help meet the needs of employers, but evolutionary changes in the workplace mean that workforce preparation must be adapted to these changes. Cooperative education must remain accountable if it is to continue serving the needs of all stakeholders: students, employers, and the institutions. Hence, co-op practitioners, educators, and administrators must present outcome data to show whether the main components of cooperative education, classroom learning, work-based learning, and teaching, give graduates significant advantages when compared to non-participants. Researchers (Gardner & Motschenbacher, 1993; Gardner, Nixon, & Motschenbacher, 1992) have shown that, immediately after graduation, co-op graduates, in some cases, experience salary advantages. Investigators have also shown that the salary advantage slowly disappears over a period of time (Gardner & Motschenbacher, 1993; Gardner, Nixon, Motschenbacher, 1992; Rogers & Weston, 1987). Information for this overview of

community college cooperative education has been synthesized with studies that used four-year colleges as models because most, if not all, research has been conducted at the four-year college level (Boesel, Rahn, & Deich, 1994). Because the community college is distinct in many ways from the four-year college, a need exists for cooperative education investigations at the community college level (Beilby, Edsall, Confrey, Gomer, Harrington, Mann, & Vitale, 1980; Wilson, 1988).

In the present study, the researcher used a survey to examine the efforts of a population of community college graduates to obtain high skills through additional education and high wages since graduation from a North Carolina community college in the year 1987. The population was divided into three groups to compare co-op and non co-op participants and colleges that do and do not offer co-op education. The three groups were established by the previous researchers (Wessels & Pumphrey, 1996) to examine the differences between graduates from community colleges with a co-op education program and those from community colleges that do not have co-op education. Wessels and Pumphrey referred to this as testing "for the campus wide effects of cooperative education on all students, whether they are in co-op programs or not" (p. 36). In a true experimental control design, group 1 (co-op graduates from a college offering co-op education) and group 2 (non co-op graduates from a college offering co-op education) would represent the treatment groups. Group 3 (non co-op graduates from a community college that did not offer co-op) would represent the control group because those graduates had no exposure to co-op education. According to Cates (1985), "the researcher uses a control group (or groups) as a standard against which to compare the

influence of the treatment on the experimental group" (p. 72). The graduates in the control group (group 3) both in previous studies (Wessels & Pumphrey, 1995, 1996) and in the present study received no treatment either directly through participation in co-op education or indirectly through the presence of co-op education on the community college campus. As true in an experimental design, random selection of the graduates was used to control for the influence of extraneous variables.

There is a need to substantiate claims about the benefits of co-op education, which include high-skill, high-wage careers. Figure 1.1 gives the general contents of Chapter One, which narrows to the reason for conducting the study and then leads to the problem statement.

Co-op Education as a Way to Achieve High-Skill, High-Wage Careers

Herman Schneider, prophet and originator who started the cooperative (co-op) education program nearly 100 years ago, used John Dewey's construct of experiential learning in 1906 to develop co-op education (Hoberman, 1994). The integration of classroom theory with practical experience in a formal program is best defined on the basis of the following criteria: the educational institution develops and approves the work situation as a suitable learning situation; the learning situation involves productive work and not mere observation; the employer pays the student for the work that is performed; the educational institution monitors the co-op student's progress on the job and the employer evaluates the student's performance; 50% of the time spent in academic study is related directly to the work experience, but the work experience is never less than 30%

of the time spent in academic study (Ricks, Van Gyn, Branton, Cutt, Loken, & Ney, 1990).

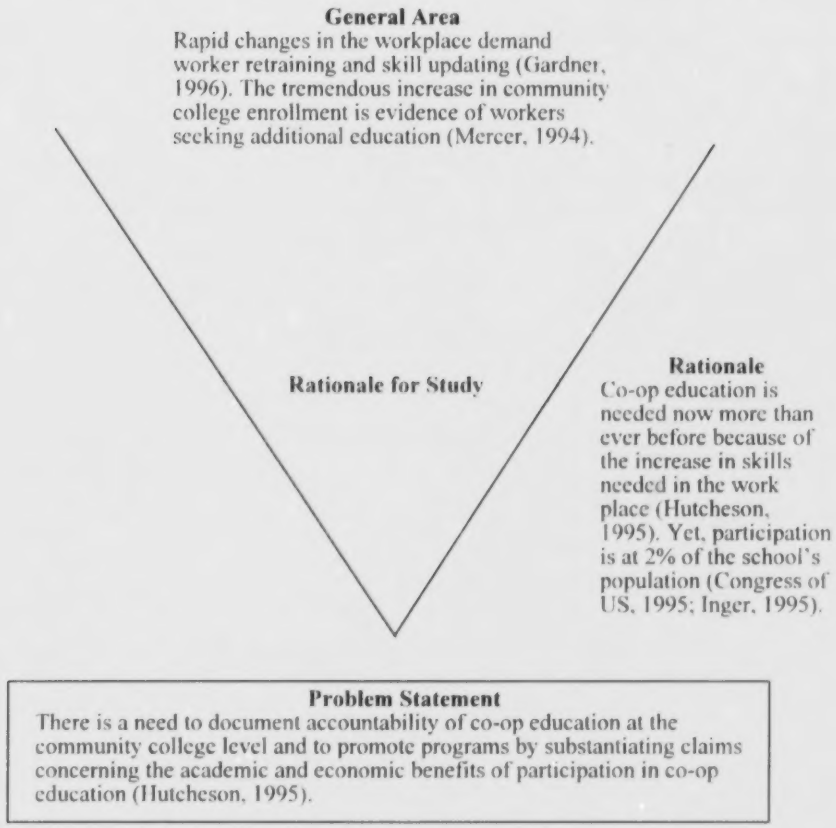
General Area
Rapid changes in the workplace demand worker retraining and skill updating (Gardner, 1996). The tremendous increase in community college enrollment is evidence of workers seeking additional education (Mercer, 1994).
Rationale for Study
Rationale
Co-op education is needed now more than ever before because of the increase in skills needed in the work place (Hutcheson, 1995). Yet, participation is at 2% of the school's population (Congress of US, 1995; Inger, 1995).
Problem Statement
There is a need to document accountability of co-op education at the community college level and to promote programs by substantiating claims concerning the academic and economic benefits of participation in co-op education (Hutcheson, 1995).

Figure 1.1. General topic, rationale, and problem statement. (Congress of the US, 1995; Gardner, 1996; Hutcheson, 1995; Inger, 1995; Mercer, 1994; Reeves, 1995).

Hutcheson (1995) stated that co-op education flourished during the 1960s, whereas Hoberman (1994) asserted that co-op education flourished during the mid 1980s until the early 1990s. The co-op program was well funded by the federal government and was well promoted to give students a "jumpstart on a full-time job after graduation" (Hoberman, 1994, p. 29); a "headstart on a full-time career" (Soloman, 1994, p. 30); and a "link between education and work" (Van Der Vorm, 1995, p. 28). Students found they could "gain professional experience without giving up the college experience" (National Commission for Cooperative Education, 1995). In addition, students who participated in co-op education programs increased their self-confidence, developed a greater sense of relevancy to and meaning in their studies, and enhanced their career awareness (Fletcher, 1989; Michigan State Department of Education, 1995; National Commission for Cooperative Education, 1994).

Today, community college co-op education is not flourishing, despite an even greater need for co-op education. Of 900 co-op education programs in the United States, 45% exist at the community college level, and two-thirds of the two-year colleges, including community and technical colleges, have co-op education programs (Way, 1990). Surprisingly, a low 2% of the student population participates in co-op education at the community college level (Congress of the US, 1995; Inger, 1995; Way, 1990). These figures suggest that co-op education at the community college level is "virtually untapped" (Way, 1990, p. 4). The questions that arise are (a) to what extent are co-op educators and practitioners promoting co-op education programs and (b) to what extent are student outcomes used to promote the programs? Information regarding how soon

after graduation students seek to update their skills, the credentials they pursue (certificates, licenses, or degrees), the motivation behind their pursuit of skills, and the types of institutions where skills are pursued would help improve and adequately market co-op education. Answering the questions of when, what, why, and where co-op graduates pursue additional education and retraining may help educators and administrators design programs that would better "prepare them [co-op graduates] for first jobs in high-skill, high-wage careers" (Congress of the US, 1993, abstract).

Need to Address Decline of Co-op Education

The need for co-op education has been prompted by evolutionary changes occurring in the economic, political, and technological realms of the local, national, and global workplace (Gardner, 1996; Vaughan & Berryman, 1989). These evolutionary changes relate to employers, funding, and students, with the end result being that the number of participating curricula within colleges is small and student participation is low (Congress of the US, 1995; Inger, 1995; Way, 1990).

The decline of co-op education may result from employers' hesitancy to participate in co-op education programs because of the lack of coordinating support from educational institutions; employer training costs (wages, time, and effort for supervising and mentoring); regulatory restrictions and extra insurance (child labor, general liability, and worker's compensation); economic uncertainty due to slowdowns in the local economy; and inadequate preparation of some students for work (Congress of the US, 1995). The federal government is the largest employer of co-op students (National Commission for Cooperative Education, 1994); therefore, because the nation faces

budget deficits, one may wonder whether there will be a decline in the federal government's ability to continue as a large-scale employer of co-op students.

According to Hoberman (1994), the greatest blow to co-op education was the withdrawal of federal funding in 1978 for secondary co-op education. Congress appropriated funding for secondary co-op from 1970-1978, and in 1978 money was diverted to a general fund. Budget cuts for secondary co-op followed, and in 1979-80 national co-op enrollment dropped by more than 100,000. Even so, federal funding for post-secondary job training, Title VIII of the Higher Education Act, did not end until 1996 (Co-op Bulletin, 1996). Some co-op practitioners felt that the end of funding through Title VIII of the Higher Education Act might have "reflected the view in Washington that colleges should accept the responsibility to fund the administration of co-op programs" (Co-op Bulletin, 1996, p. 2).

Many factors may have affected the decline of student participation in co-op education. One factor may be the rapid increase in part-time community college students who must remain employed full time (Snyder, Hoffman, & Geddes, 1996). Increasing college tuition fees and family responsibilities, along with rapid changes in the workplace, drive many students to take classes part time and to remain employed full time, leaving no time for a co-op position (Heinemann, 1988; Kane, Parsons, & Associates, 1984; Varty, 1988). Maintaining full-time employment while obtaining needed skills for the 21st century has become a necessity for many workers concerned with upward mobility (Gardner & Tyson, 1994; Hickey, 1995).

The need for co-op education has also been affected by drastic economic changes in the workplace that challenge workers to hold on to full-time employment. Employers are now trying to maintain higher productivity with fewer workers (Stone, 1994). The desire for fewer workers comes at a time when the number of workers in the labor market has increased because of the longer average life span. The longer average life span has increased "job competition among the nation's aged managers and workplace administrators" (Zdorkowski & Thomas, 1984, p. 4). Company mergers are occurring at an alarming rate, bringing about a tremendous increase in job loss, job reassignment, and company budget cutbacks (Gardner & Tyson, 1994; Varty, 1994). These changes in the workplace have lessened long-term employability for some (Gardner & Tyson, 1994; Varty, 1994). Changes in today's workplace have meant that the economy is more global, creating increased competition with foreign and local businesses, a demand for speedy delivery of goods and services, and expanded trade (Gardner, 1996; Vaughan & Berryman, 1989).

Co-op education and the skills it provides are needed now more than ever before because of structural transformations in the workplace hierarchy. Changes in the politics of workplace advancement have resulted in a flattening of hierarchies and elimination of supervisory layers (Gardner, 1996; Grubb, 1995; Risenberg, 1995; Zdorkowski & Thomas, 1984). The traditional hierarchical structure of the workplace has now been replaced with a spider web structure described as a web of inter-locking smaller firms (Gardner & Tyson, 1994;Varty, 1994). To move their careers forward in a web, workers must change positions more frequently. Frequent job changes are necessary because hard

work and loyalty are no longer valued by organizations. Employers now seek workers they need for tomorrow, based on tomorrow's skills (Gardner & Tyson, 1994; Varty, 1994). The objective of the web structure is to help workers receive higher pay, gain new skills, and to be more creative. Instead of hard work and loyalty, employers now rank flexibility, creativity, and risk-taking (generating ideas) at the top of their list of desirable employee traits (Gardner & Garth, 1993). Another political reality of the workplace is diversity because employers realize that differences in the workplace bring forth a spectrum of creativity, ideas, experiences, and new ways to approach old problems. The Cooperative Education Association conducted a survey in which employers revealed that diversity recruitment has become a key issue and concern (Leary, 1996). Diversity deals with not only issues of race but also of gender, religious preference, nationality, learning, and lifestyle (Leary, 1996). In addition to the economic and political changes in the workplace, technological changes are occurring, such as the application of computer technology and accelerating technological advances (Risenberg, 1995; Zdorkowski & Thomas 1984).

Workplace changes demonstrate the importance of using co-op education to develop job skills based on employers' projected needs for the 21st century. The tremendous increase in enrollment of community college students evidences this importance. Enrollment growth for community colleges has "outpaced increases at four-year colleges," with 60% of the nation's college students now enrolled in community colleges (Mercer, 1994; NC Fact Book, 1996). In 1995, the number of students enrolled

in two-year colleges demonstrated a sevenfold expansion over the past three decades, with more than 5 million students enrolled (Congress of the US, 1995).

However, student enrollment figures for community college co-op educational programs have not kept pace with the overall growth in community college enrollment (Stern, Finkelstein, Stone, Latting, & Dornsite, 1995). To increase student enrollment figures for community college co-op education and to be successful in preparing students for first jobs in high-skill, high-wage careers, community colleges must begin with their senior executive leadership (Charner, 1996; Hutcheson, 1995). But education professionals should partner with others as they seek to expand the general awareness of and promote support for co-op education from senior executives. Those in industry and government as well should seek to create a sustained, strong message about the importance of co-op education (Hutcheson, 1995). Where co-op education finds an advocate at the executive level, support for co-op education is more likely to take root through the educational system (Charner, 1996). In the absence of federal funding that ended in 1995, support is needed from college presidents and senior administrators that can be translated into widespread financial support.

Need for Community College Co-op Research

As a way to promote co-op education, this study assesses academic and career outcomes of co-op education graduates 10 years after graduation from a community college. Few studies have examined, by survey method, the additional education that co-op education graduates have pursued (Pumphrey & Wessels, 1995). "Cooperative education is the oldest and most widely used model of work-based learning and the most

extensively researched" (Congress of the US, 1995, p. 67). Despite copious studies of co-op education, these studies have focused mainly on four-year colleges and universities and not on community colleges (Boesel et al., 1994; Heinemann, 1988; Inger, 1995).

That most of the co-op studies focus on four-year colleges and universities is understandable because co-op education originated nearly a century ago at a university and not a community college. In the years that followed the establishment of the first program, co-op education was adopted by other universities and four-year colleges and not by two-year or community colleges. According to the Cooperative Education Research Center at Northeastern University (1987), it was not until 1950 that Charles Stuart Mott Community College in Michigan became the first institution to offer co-op education as it is known today (Heinemann, 1988). Grubb and Villeneuve (1995), however, argued that co-op programs were first extended to two-year colleges in 1937 in Cincinnati. When research was conducted, the more well-established co-op programs were used as models because community college co-op programs were still new programs. Nevertheless, by 1965, about 140 community colleges had started programs (Heinemann, 1988). Even though co-op education could help accomplish the mission of community colleges, community college co-op education was considered a "relatively unknown and very underutilized strategy" (Heinemann, 1988, p. 60).

There is a need to investigate community college co-op programs because not only are there few co-op studies at the community college level but their co-op programs are unlike four-year college and university co-op programs. Community college co-op programs are distinct because (a) their mission differs greatly from that of the four-year

college or university, (b) the co-op student population is comprised of a higher percentage of students 25 years old and older, (c) the parallel format for scheduling instruction and not the alternating format is used more frequently, and (d) the student's main goal may not be to obtain a degree.

Community Colleges Show Marks of Distinction

From an educational perspective, community colleges differ from baccalaureate-granting institutions because the community college is committed to comprehensiveness encompassing four basic thrusts: career/occupational, transfer, continuing education/lifelong learning, and open enrollment (Heinemann, 1988). In the career/occupational arena are two-year associate degrees and one-year certificates designed to prepare students for entry into the labor market immediately after graduation (Heinemann, 1988). Most four-year colleges and universities are unable to adapt quickly to employment swings in technological occupations that are occurring in the rapidly changing workplace (Heinemann, 1988). In contrast, community colleges can adapt quickly to employment shifts.

Through two-year college co-op programs, institutions can be alerted to adjust existing programs or create new ones to meet the emerging human resource needs of employers, which can serve as an early barometer of employment shifts (Heinemann, 1988). Community colleges have become a primary source for technical support staff in a variety of fields because the range of programs is determined by employment needs (Heinemann, 1988). Examining community college co-op education is indeed important because "much of the training that is needed by workers is of a technical nature and

cannot be satisfied at the four year college/university level" (Puyear, 1997, p. 2). That student enrollments at community colleges are growing rapidly indicates that one of the most attractive features of many community colleges is the wide range of technical training programs for tomorrow's job market (World Book Multimedia Encyclopedia, 1998).

Community colleges also distinguish themselves by setting the pace in recent higher education trends. Higher education in general is experiencing two significant trends in student enrollment resulting from the need for retraining (Frengel, 1997; Varty, 1988). Institutions have recognized growth in part-time enrollment through an increase in the number of older students (Snyder, Hoffman, & Geddes, 1996). Pluta (1992) stated that two-year colleges have experienced significant increases in part-time enrollment, and, of the students who attend two-year colleges, 61% attend part time. During 1980-90, enrollment of students 25 years old and older increased by 34%, in contrast to only a 3% increase in students under the age of 25 in higher education (Snyder, Hoffman, & Geddes, 1996).

Enrollment of older students makes the community college co-op program distinctive. "Community colleges have about two and one half times more adults over age 25 registered in co-op than four-year colleges" (Heinemann, 1988). An important part of the community college's mission is to address the community's needs whether the student is traditional or non-traditional (defined as 25 years old and older). Non-traditional students represent the taxpayer, voter, homeowner, and business leader. Therefore, the non-traditional student's educational needs are good indicators of the

needs the community colleges should address. Older students are an essential part of the community, a group of responsible citizens who are part of the workforce and who have families and varied interests in their communities.

Unlike four-year colleges and universities, community colleges typically use the parallel format as opposed to the alternating format for scheduling instruction (Heinemann, 1988). The parallel format, which originated with the community college, allows the student to take classes part of the day and have a cooperative work assignment during the other part of the day (Hutcheson, 1996). In contrast, the alternating format requires a student to alternate a period of full-time attendance in class with a period of full-time employment (Hutcheson, 1996). The parallel format is widely used by community colleges because of the pressure to fit course requirements within 2 academic years (Heinemann, 1988). Sixty-six percent of the co-op programs at community colleges use the parallel format, as compared to 26% of four-year colleges and universities (Heinemann, 1988). The benefit is that participants under a parallel format can take a full course load, graduate within 2 years, and still participate in the co-op experience (Heinemann, 1988).

The community college student's goals and objectives are quite unlike those of the four-year or university student. When community college students enter college, many of them, unlike four-year college and university students, do not intend to earn an academic degree. Rather, their primary reason for enrolling is to acquire job-related skills (Carter, 1990; Court & Connor, 1994). Because large numbers of community college students are 25 years old and older, a significant number of new community college

students (30%) already have bachelor's degrees (Hoerner & Wehrley, 1995). Typically, community college students with bachelor's degrees are seeking "technical skills not accessible at the four-year colleges" (Hoerner & Wehrley, 1995). Varty (1988) stated that community college co-op administrators and practitioners need to determine the program's role, if any, in retraining the current workforce and individuals dislocated by either technology or because of declining industries. At present, co-op education programs may not be meeting the needs of dislocated workers who can gain from structured work experience like co-op education but who cannot afford the alternating or parallel format because of family commitments (Varty, 1988).

Problem and Background

Co-op practitioners, educators, and program administrators in higher education have increasingly recognized the importance of aligning academics and careers. The need for applied curriculum has never been more prominent than it is today (Baker, 1998, personal communication; Hutcheson, 1995). Co-op education is an applied curriculum whose aim is to enhance learning and professional outcomes through integration of classroom theory with practical experience. However, research does not indicate the extent to which co-op educational programs achieve their objectives because "evaluations of co-op in two-year colleges have been too sparse and too limited to permit firm conclusions or generalizations" about their effectiveness (Inger, 1995, p. 1). Empirical research that has assessed whether community college co-op graduates continue to enhance their learning and to achieve professional gains after graduation are scant (Beilby et al., 1980; Boesel et al., 1994; Heinemann, 1988; Inger, 1995; Loken,

Cutt, & Lumsden, 1996; Ricks, 1996; Wilson, 1988; Wilson, Stull, & Vinsonhaler, 1996). Even though co-op education is the most widespread work experience program at the secondary- and post-secondary levels, the majority of the evaluations at the post-secondary level are of four-year institutions (Boesel et al., 1994).

Co-op practitioners, educators, and program administrators in higher education are giving more attention to program evaluations and student outcome studies at the community college level in efforts to make their programs more accountable (Gardner & Motschenbacher, 1997). The increased need to demonstrate the effect of community college co-op participation on academic performance and related outcomes is driven by students and parents who want returns on their investment in co-op education, meaning high-skill, high-wage jobs (Hutcheson, 1995).

Thus, there is a need to document accountability of co-op education, especially at the community college level. There is a need to demonstrate not only that these graduates obtain "high-skill, high-wage" jobs but also to determine how graduates accomplish this (Gardner & Motschenbacher, 1997). The best way to identify student outcomes, such as transitioning into "high-skill, high wage" jobs, is to examine results from graduate follow-up studies (Congress of the US, 1993; Halperin, 1994; National Institute for Literacy, 1994; Pierce, 1994). Follow-up studies are easily accessed because, in many cases, "state and federal laws mandate that follow-up studies be conducted" (Conklin, 1992, p. 69). Documenting accountability of community college co-op education requires examination of outcome studies that consider five important variables: community college, co-op education, graduates, additional education, and salary. In seeking studies

that examined community college co-op education graduates' pursuit of additional education and salary gains, the researcher was unable to find studies that examined all five variables. Therefore, this study would add much to the dearth of information and is an area worthy of further study.

This study aims to shed light on two issues that have yielded conflicting results in previous studies. The first issue concerns the value of academics from the viewpoint of community college students and graduates (Carter, 1990; Court & Connor, 1994; Heinemann, 1988; Heller & Heinemann, 1987). The second issue concerns the salary advantage that co-op graduates may or may not experience in the workplace (Gardner, Nixon, & Motschenbacher, 1992; Kotter, 1995; Roger & Weston, 1987; Rowe, 1992; Siedenberg, 1990; Vickers, 1990; Wessels & Pumphrey, 1995, 1996).

Conceptual Framework

The conceptual framework for co-op education (Figure 1.2) is drawn as a flowchart of overlapping and interlinked circles and squares, with arrows that guide the flow of the experiences from one component to another. The interlinking of these components indicates interrelationships of variables and advantages for the main three stakeholders in the experience: student, employer, and institution. Components I through V depict what the graduate (Component VI) needs. The conceptual framework depicts the variables examined in this study to determine why co-op graduates, more so than non co-op graduates, pursue additional education and receive salary gains. Table 1.1 includes the research hypotheses formulated from the conceptual framework and further explains the conceptual framework.

Table 1.1
Research Hypotheses Formulated from Conceptual Framework

Framework Components	Student/Graduate Experiences	Program Characteristics	Activities That Support Characteristics	Research Hypotheses Comparison to Non Co-op
Component I. **Classroom Learning**	- Benefit from applied work-base teaching techniques - Perform laboratories - Utilize equipment - Benefit from contextual curriculum - Change the way meaning is made – transformational learning (Ricks, 1996) - Learn from each other, reciprocal	- Classroom instruction provides technical information related to work experience (**Mitchell, 1977**) - Laboratories and equipment make learner aware of resources (**Ricks, 1996**) - Defines contextual curriculum as learning occurring in real life context (**National Commission for Cooperative Education, 1998**)	- Discuss work-site issues in class - Provide guest speakers and business and industry tours - Bring in literacy materials from workplace - Structure learning into projects (**Charner, 1996**)	Co-op students: - Retain more information from classroom and work experience and apply knowledge more effectively (**Branton et al., 1990**) therefore: **H_4^1: There is no significant difference in salaries for co-op and non co-op graduates in the variable have completed additional education.**
Component II. **Community College**	- Develop the appropriate skills needed for the workplace	- Institution (college) officials make sure that teaching staff incorporate learning opportunities that draw on work-site challenges (**Charner, 1996**) - Awards college credit (Dallas County Community College District, 1983)	- College faculty visit work sites - Business/industry internships for instructors (**Hoerner & Wehrley, 1995**) - "Work-a-Day" in industry for instructors - College coordinator monitors job	Not measured in this study
Component III. **Co-op Employer**	- Apply for positions that utilize skills developed in the classroom (Stern, et al., 1992)	- Employers make sure that work-site supervisors incorporate learning opportunities that draw on classroom theory	- Employers visit classrooms - Provide summer employment for instructors (**Hoerner & Wehrley, 1995**) - Act as mentors for instructors - Provide jobs for students	Not measured in this study
Component IV. **Work-Based Learning**	- Practice skills developed in the classroom - Learn new skills - Manage individual projects - Earn an income	- Integrates work-based and classroom learning (**Hoerner & Wehrley, 1995**) - Promotes self-directed learning (Leslie, 1996) - Allows students to gain broad technical competence and understand all aspects of industry - Work experiences are productive	- Educational experience is tailored to learner (**Charner, 1996**) - Colleges document a set of competencies with business partners for students (**Charner, 1996**) - Students gain broad knowledge through rotations within industry - Coordinator monitors student at worksite	Co-op students: - Realize link between work and school - Have greater confidence, perceive themselves more capable, are better motivated and more independent (**Branton et al., 1990**) therefore: **H_4^2: There is no significant difference in co-op and non co-op graduates in the variable is currently pursuing additional education.**
Component V. **Teaching Enhances Learning**	- Benefit from applied work-based teaching techniques in the classroom and at the work site that aid in the transfer of skills - Reciprocal learning relationship with teacher and each other (**Baker, et. al., 1990; Merriam & Caffarella, 1991**)	- Educators implement new teaching strategies including apprenticeship approach (modeling, supporting, and turning over tasks/projects to students (**Charner, 1996**) - Work experiences are supervised by personnel - Identifies four critical teaching roles at the workplace	Teaching roles: - classroom instructor - workplace: - coordinator – career path design - manager – department learning - coach – demonstrates tasks, and - mentor – initiates into workplace culture (**Hamilton & Hamilton, 1997**)	Co-op students: - Receive relevant feedback to learning more frequently, develop confidence and a positive self image, role models encourage them to aspire to improve (**Branton et al., 1990**) therefore: **H_4^3: There is no significant difference in co-op and non co-op graduates in the variable have received bachelor's degrees.**

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Framework Components	Student/Graduate Experiences	Program Characteristics	Activities That Support Characteristics	Research Hypotheses Comparison to Non Co-op
Component VI. **Professionally Employed Graduate**	- Confronted with workplace changes - Realizes a need for additional education and lifelong learning **(National Commission for Cooperative Education, 1996)** - Secures salary increases with additional education	- Monitors the needs of employers - Provides job experience for entry level positions - Provides salary advantage after graduation **(Gardner & Motschenbacher, 1993)**	- Graduates identify and follow lifelong occupational journey involving additional education and employment - Graduates achieve high academic standards **(Hamilton & Hamilton, 1997)** - Graduates obtain jobs that pay well	Co-op graduates: -Experience a salary advantage over non co-op graduates **(Congress of US, 1995)** therefore: **H_o^4: There is no significant difference in co-op and non co-op graduates in the variable salary category with the highest frequency of graduates for 1987 and 1997.** **H_o^5: There is no significant difference in co-op and non co-op graduates in the variable employers require additional education for salary gains.** **H_o^6: There is no significant salary difference in the proportion of co-op and non co-op graduates in the variable that have completed additional education.**

Note Synthesized from text: Baker, Roueche, & Gillet-Karam, 1990; Branton, VanGyn, Cutt, Loken, Ney, & Ricks, 1990; Charner, 1996; Gardner & Motschenbacher, 1993; Hamilton & Hamilton, 1997; Herner and Wehrley, 1995; Johnson, 1996; Leslie, 1996; Mitchell, 1977; National Commission for Cooperative Education, 1998, 1996; Ricks, 1996; Stern, Stone, Hopkins, McMillion, Cagampang, 1992.

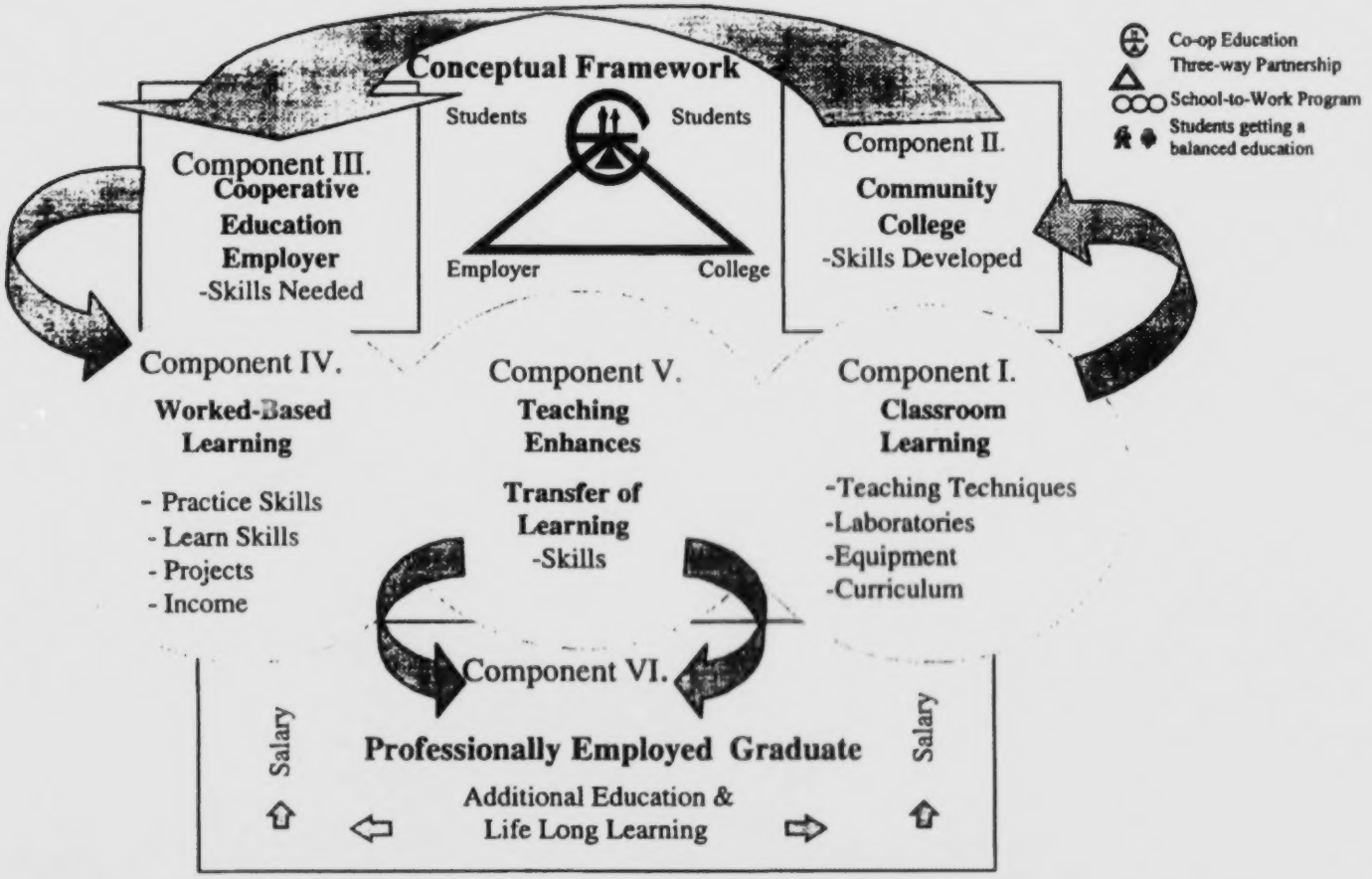

Figure 1.2. Conceptual framework of the dissertation follow-up of North Carolina Community College System Cooperative Education Graduates: Additional education and salary gains

Synthesized from text: Charner, 1996; Hamilton & Hamilton, 1997; Johnson, 1996; Ricks, 1996; Tillton Square Community College Co-op Handbook.

As one of the school-to-work transition programs, co-op education has three main components: school-based learning (classroom learning), work-based learning, and teaching (Hudelson, 1994). The overlapping circles in the conceptual framework (Figure 1.2) represent components of co-op education that are common to school-to-work transition programs. The educational institution, the community college, and the employers jointly develop job competencies that relate to both the academic field of study and the job. The conceptual framework of co-op education starts with classroom learning that allows students to develop a knowledge base before going to the job site. Work-based learning allows the student to use what he or she learned from the classroom at the work site. Teaching is the critical component that links classroom learning to work-based learning.

Teaching is the central construct of co-op education, the connecting link between classroom learning and work-based learning, that occurs both in the classroom at the community college and with the co-op employer at the work site. The influence of teaching continues as co-op graduates further their learning at work, once professionally employed. Teaching is the sharing of knowledge, a "reciprocal, interdependent relationship" between student and teacher that takes place in classroom learning at the community college and in work-based learning through supervisors at the job site (Baker, Roueche, & Gillett-Karam, 1990). From the components depicted in the conceptual framework, it is theorized that co-op students have a greater opportunity than do non co-op students to understand the connection between school and work (Inger, 1995; Stern et al., 1992).

This study explored additional education and salary gains obtained by both co-op and non co-op community college graduates 10 years after graduation. Non co-op students usually acquire work unrelated to their curriculum program requirements (Grubb & Villeneuve, 1995). These students do not have formal visits from an institution official nor do they receive college credit for the work performed. Upon graduation and after becoming professionally employed, co-op graduates are more likely to continue making connections with their work and school because co-op education "promotes the process of lifelong learning" (National Commission for Cooperative Education, 1994). Researchers have also shown that co-op students see a need to pursue additional education and, therefore, have higher aspirations for education than do non co-op students.

Co-op education promotes the process of lifelong learning because academics are emphasized as the way to stay current with knowledge and skills required for the job (Halperin, 1994; Imel, 1995; National Commission for Cooperative Education, 1994). The idea of co-op arose from a need in the academic field of engineering (Grubb & Villeneuve, 1995; Wilson, 1971). The vision was grounded in the construct of John Dewey's experiential learning theory, and, since its beginning, co-op education has evolved to include a variety of programs that blend academics and work. Some colleges require co-op students to sign learning contracts that incorporate minimum competencies based on student-centered objectives and program requirements, reading lists, or requirements of a final paper (Dallas County Community College District, 1983). Some co-op students may be asked to document their attainment of a specific number of the job

performance objectives (Heinemann, 1988). Many colleges require students to "attend a seminar either before, during, or after their co-op experience" (Heinemann, 1988, p. 59). Co-op blends classroom learning and work-based learning and, in so doing, demonstrates that "learning is a lifetime pursuit and it does not end after graduation" or when one leaves the formal classroom setting (Vaughan, 1995). As stated previously, Heller and Heinemann's study (1987) of two- and four-year co-op and non co-op students demonstrated that some co-op students see a need to pursue additional education and, therefore, have higher aspirations for education than do non co-op students. Some researchers (Congress of the US, 1993; Halperin, 1994; Imel, 1995) have suggested that co-op education increases opportunities for further education or training and helps students to gain basic skills to pursue further education and lifelong learning.

The conceptual framework for the study of co-op education in the North Carolina Community College System (Figure 1.2) was designed in agreement with criteria outlined by Boone (1993):

> The conceptual framework includes a display of your concepts and variables that depict interrelationships. Ideally, this conceptual framework frames your study by accenting your independent, intervening, and dependent variables. It is from your conceptual framework that you begin formulation of the hypotheses that become the focus of inquiry. (Boone, 1993, personal communication)

Purpose of the Study

The following purposes guided the development of the present study and the research questions and hypotheses:

1. address the problem of accountability of co-op education at the community college level;

2. determine the extent to which community college co-op graduates pursue additional education and achieve salary gains;

3. provide the North Carolina Community College System with outcome data for 1987 co-op and non co-op graduates at least 10 years after graduation;

4. report the proportion of graduates currently pursuing additional education;

5. report the proportion of graduates who have obtained a bachelor's or higher degree since graduation in 1987; and

6. provide long-term salary data for the 1987 graduates.

Overview of Methods

This study provided a longitudinal view of North Carolina Community College System graduates treated as three strata and selected using stratified simple random sampling (Fowler, 1992, personal communication). The three strata represent (a) group 1–co-op graduates from a school that offered co-op education; (b) group 2–non co-op graduates from a school that offered co-op education; and (c) group 3–non co-op graduates from a school that did not offer co-op education.

To characterize co-op and non co-op graduates, the researcher ensured the subjects in each group were reasonably equal (on average) in all important criteria, otherwise, as Slavin (1984) pointed out, unequal selection effects, or selection bias, might make any differences found among groups uninterpretable. Therefore, the presence

of group 3, the control group, indicated that the researcher ruled out contributions from confounding variables, the effects of which could not be separated.

Additional education or training (on-the-job, two-year, four-year college training or degrees, military training, satellite or correspondence courses, etc.) acquired since graduation was self-reported. Employment data (status and salaries for 1987 and 1997) were also self-reported. A mail survey was used to collect data on the extent to which co-op and non co-op graduates pursue additional education and achieve salary gains. The independent variables were community college and co-op education; dependent variables were graduates, additional education, and salary. This study employed a mail survey the researcher adapted from Wessels and Pumphrey's (1995, 1996) telephone survey. The 1993 and 1995 data Wessels and Pumphrey generated from the telephone survey have been shared with the co-op community through two peer-reviewed publications. The telephone survey (Wessels & Pumphrey, 1995, 1996) focused on the effects of job search time, the quality of job placement, and impact on wages; whereas the researcher's mail survey focused on additional education after graduation and salary gains. The data were analyzed using SAS chi square.

Research Questions and Hypotheses

This study addressed the following research questions and their related hypotheses. Hypotheses were accepted or rejected at $p < .05$.

1. What proportion of graduates have completed additional education since their graduation?

H_0^1: There is no salary difference in the proportion of co-op and non co-op graduates who have completed additional education.

2. What proportion of graduates are currently pursuing additional education?

H_0^2: There is no difference in the proportion of co-op and non co-op graduates pursuing additional education.

3. What proportion of graduates have obtained a bachelor's degree or higher since their graduation in 1987?

H_0^3: There is no difference in the proportion of co-op graduates and non co-op graduates who have obtained a bachelor's degree or higher since graduation in 1987.

4. What salary category had the highest frequency of graduates for 1987 and 1997?

H_0^4: There is no difference in the salary category of co-op and non co-op graduates for 1987 and 1997.

5. What proportion of graduates indicated that their employers require completion of additional education to receive a salary increase?

H_0^5: There is no difference in the proportion of co-op and non co-op graduates who indicate that their employers require completion of additional education to receive a salary increase.

6. What proportion of co-op graduates who have completed additional education have higher salaries than non co-op graduates with additional education?

H_0^6: There is no significant salary difference in the proportion of co-op and non co-op graduates for 1987 and 1997 who have completed additional education.

Key Terms

The terms used in this study were adapted from those defined by Baker and associates (1990); Biester (1972); Elliott (1974); Grubb and Villeneuve (1995); Heermann (1972); Heinemann (1988); Hutcheson (1996); Knowles and associates (1971); Mitchell (1977); National Commission for Cooperative Education (1999); Pearson (1982); Ricks (1996); Vickers (1990); Wessels and Pumphrey (1995, 1996).

Additional Education	Education acquired after graduation from a North Carolina community college, which includes community college courses, degrees, certificates, four-year college courses, degrees, certificates, licenses, professional degrees, on-the-job training (on-site, off-site), satellite courses, on-line courses, and teleconferences.
Alternating Program	Students alternate periods of full-time attendance in academic classes with periods of full-time employment in positions of educational value approved by the institution.
Applied Learning	A learning strategy emphasizing the context or practical circumstances within which a student might apply the skills or knowledge.
College Credit	Students receive academic credit and a grade for participation in co-op education.

Contextual Learning	A learning strategy emphasizing the context or practical circumstances within which a student might apply the skills or knowledge.
Co-op Education Employer	Employer who contracts with community colleges to employ co-op education students.
Co-op Education	An educational program integrating classroom studies with paid, productive work experiences related to a student's academic or career goals.
Co-op Participation for Degree	Clarifies co-op program characteristics that guide student participation, such as mandatory, optional, and selective.
Co-op Participant	A graduate who chooses to participate in co-op education while attending a North Carolina community college.
Institutional Effect	The presence of a co-op programs on college campuses that have external benefits on non co-op students.
Length of Co-op Work Periods	Refers to the amount of time a student is employed during an individual co-op work period. Often, this period is a semester or a term.

Mandatory Program	Students in a college or a department are required to participate in the cooperative education program as a part of their academic program.
Non Co-op Participant	Graduate who did not participate in co-op education while attending a community college in North Carolina. These graduates are divided into two groups: those who were offered co-op education at their college and those who were not offered co-op education at their college.
Non-credit	College credit is not given for participation in co-op education.
Number of Co-op Work Periods	Refers to the maximum or minimum number of work experiences in which a student may participate during the entire college program.
Optional Program	Participation in the cooperative education program is not required in order to complete the academic program.
Parallel Program	Students attend classes full time for a segment of the day and work part time for another segment of the day at a position approved by the institution.
Program Type/Format	Refers to the alternating, parallel, field work, or extended day scheduling of co-op work periods.

Reciprocal Learning	A process of learning in which teachers learn from students and students learn from teachers and each other.
Salary Gain	An increase in salary over the time period from 1987, the year of graduation, to 1997, the year the study was conducted.
School-to-Work	A system of education promoting contextual learning for all students, incorporating school-based learning, work-based learning, and connecting activities. The system is based on local partnerships of secondary schools, post-secondary institutions, business, community groups and government; also School-to-Careers.
Self-directed Learning	The learner is guided to learn and not led to learn by encouraging the use of learning resources; learning is student centered and tailored to the learner.
Selective Program	The college establishes certain prerequisites for student participation in cooperative education. These prerequisites may include a minimum grade point average or completion of prescribed courses. In other cases, the program may simply require that the student be enrolled and in good academic standing.

Semester	Term of the school year for co-op education training. Community colleges in the North Carolina Community College System currently use the semester program consisting of 16 weeks, whereas some colleges around the nation may use the quarter system of 11 weeks of training.
Sophomore Year	Refers to the second year or senior year of school at a North Carolina community college; final year of training.
Structured Program	This program requires the co-op education experience be related to an academic program or career goals and may include formal visits from the school's co-op coordinator.
Transformational Learning	Learning that changes the way we make meaning from experience by causing the learner to dig down to the roots of assumptions and preconceptions.
Unstructured Program	This program does not include a formal requirement that the co-op education experience be related to program or career goals.
Work-based Learning	Educational programs or strategies that integrate learning at school-approved work positions with learning in the classroom.

Year Placement Begins	Designates the college year (e.g., freshman, sophomore) in which students may begin their first co-op work assignment.

Implications

Few studies have examined community college co-op education (Boesel et al., 1994; Heinemann, 1988; Inger, 1995), and even fewer have compared co-op and non co-op graduates with respect to additional education pursued and the salary gains each group has achieved. With the changes occurring in today's workplace, such as an increase in international competition, expanding trade, and accelerating technological advances, the pursuit of additional education may be a critical factor in maintaining long-term employability (Hickey, 1995). A logical place to begin documenting accountability for co-op education is with additional education acquired by co-op and non co-op graduates and their respective salary differences.

In contrast to a cross-sectional study that might examine different graduating classes, this study had the advantage of representing a longitudinal study of the same graduating class from 1987 that was re-examined in 1993, 1995, and 1998. A very useful outcome of the mail survey is that it now includes address updates from graduates of the North Carolina Community College System 10 years after graduation. This database has provided the program planners of the North Carolina Community College System with information consistent with priorities established by the United States Department of Education, Title VIII Higher Education Act of 1965 (Cooperative Education Program, 56 Fed. Reg. 47286, 1991). The priorities include:

1. longitudinal studies of former cooperative education students and non-cooperative education students to determine the relationship between the student's cooperative education work experiences and one or more of the following: (a) initial job placement, (b) job advancement, and (c) long-term earnings; and

2. assessment of the impact of cooperative education on college retention rates and academic achievement of students participating in cooperative education compared to that of non-participants (Cooperative Education Program, 56 Fed. Reg. 47286, 1991).

The mail survey defined co-op/non co-op graduate, additional education after graduation from a North Carolina community college, employment status, and demographics and solicited comments about the survey that could be used to refine the instrument. The mail survey was pre-tested using 1988 graduates of Tillton Square Community College (pseudonym) in Tillton (pseudonym), North Carolina. Wessels and Pumphrey, the previous researchers, were available as consultants in this research endeavor. Because little empirical research about co-op and non co-op graduates at the community college level exists, the possibilities for future research are considerable.

Limitations of the Study

The most significant limitations in the present study were the inability to control for response effect errors (reliability), to generalize the data (validity), and to get a good sample from the population. Some of these limitations arose from problems in how co-op education is defined and from using a survey method to collect data.

Response effect errors occur in survey research and fall into three classes: (a) deliberate or motivated errors in which respondents add or omit information in order

to make a good impression on the researcher or to prevent the researcher from finding out something, (b) memory errors that may relate to whether something happened or when it happened, and (c) communication errors caused by the researcher not making clear to the respondent what is being asked (Rossi, Wright, & Anderson, 1983). The topics examined in this study, additional education acquired and salary gains after graduation, were sufficient to increase the propensity for intentional response bias, because respondents might want the researcher to think they acquired additional education and achieved higher salaries than they did. Anonymity was assured to diminish the inclination of respondents to provide inaccurate information.

The inability to generalize the data (external validity) resulted from the wide variability in how the literature defines co-op education programs by practice (Ricks et al., 1990). Program differences include (a) the official number of co-op work terms that students may experience, (b) the necessity for work terms to start and end with the academic terms, and (c) the extent to which work terms appear to be integrated into the academic program. "Perhaps variability in practice leads to even greater variability in outcomes than has been documented" (Ricks et al., 1990, p. 10).

Acquiring a good sample from a population often arises when mail surveys are used, as was the case in this study. Persons move and may not leave a forwarding address, and others may receive a survey and then misplace, damage, or completely destroy the survey by mistake. These occurrences can reduce the response rate (Rossi, Wright, & Anderson, 1983).

Summary

Chapter One provided an overview and explanation of this research, and co-op education was introduced as a program that integrates school and work. Technological development and changes in the global workplace that dictate the need for the worker to continue integrating school and work through additional education were also discussed. The conceptual framework was described; the purposes for the study, research questions, and hypotheses were provided; key terms were defined; and the implications of the study were discussed. The chapter concluded with a discussion of the more significant limitations of the study.

CHAPTER TWO

REVIEW OF THE LITERATURE

Real education comes after we leave school and there is no reason why it should stop before death. –John Dewey (1859-1952)

Overview

John Dewey's construct of experiential education was the foundation of Herman Schneider's idea of cooperative (co-op) education. Schneider made observations based on his career and on the prospective careers of students in his classes, and his work led to the implementation of co-op programs throughout the nation and similar programs in other countries.

A critical examination of literature published after 1980 is included in this literature review. Because the workplace of today is very different from the workplace of 20 years ago, comparing co-op education outcome studies conducted prior to 1980 with more recent studies would be immaterial. A main source of research data has been the one and only journal of co-op education, established in 1963 and first published in 1964 by the Cooperative Education Association, *The Journal of Cooperative Education* (Porter & Nielsen, 1986). The US Congress and various other governmental agencies have also reviewed and conducted relevant studies. The literature presented here supports the idea that exposure to the characteristics and activities of co-op programs, either directly through the student's participation or indirectly through the college's participation, motivates graduates to realize a connection between school and work, pursue additional education, and subsequently achieve salary gains. Variables (components of co-op

education) and the relationships among these variables, classroom learning, community college, co-op employer, work-based learning, teaching, and the professionally employed graduate, form the foundation of this study. The literature pertinent to this study's hypotheses and conceptual framework (Figure 1.2) is presented.

Some tasks in co-op education are performed or repeated again and again, and this interrelationship of the components is demonstrated by the overlap of information. For example, work-based learning integrates school and work, and classroom learning integrates school and work; the community college works to make sure that faculty are up to date with professional development and the co-op employer helps to keep faculty up to date with professional development through summer employment, tours, and site visits (Hoerner & Wehrley, 1995). Teaching and mentoring of students occur both in the classroom and at the work site. The student/graduate receives a foundation for a professional career and lifelong learning from the community college and also receives a foundation for a professional career and lifelong learning from the co-op employer (National Commission for Cooperative Education, 1994; Vaughan, 1995). Schneider conceived these interrelationships nearly 2 years before he could formulate his ideas into a workable plan of co-op education.

Schneider and the Formulation of Co-op Education

While working as an engineering professor at Lehigh University in 1903, Schneider conceived the idea of cooperative education. Schneider recognized two problems in educating engineers and worked to solve these problems (Grubb & Villeneuve, 1995; Wilson, 1971). First, most engineering students sought and obtained

part-time jobs so they could afford an education. However, these jobs were unrelated to their future careers. Second, certain curricular components could not be handled in the classroom. There was no substitute for specific pieces of required equipment and, often, no way to improvise techniques, that is, there was no way to simulate real world situations. Schneider's real concern was making the students' education relevant to their future careers. Therefore, he devised a plan to give students work-related job experience that could be integrated with the engineering curriculum. His ideas were in fact a combination of what is now termed work-based and school-based learning.

From Lehigh University in Bethlehem, Pennsylvania, Schneider later moved to the University of Cincinnati in Cincinnati, Ohio, as an engineering professor, became the Dean of Engineering, and eventually served as the president for a brief time. While at the University of Cincinnati, he was authorized in 1906 to institute the first cooperative education program, and he worked hard to get employers to accept the program (Grubb & Villeneuve, 1995; Wilson, 1971).

Even though the first cooperative education program began experimentally, the program was at least consistent with the goals of higher education. A major concern of higher education leaders then was to move away from ivory tower aloofness and isolation from the world to direct involvement in practical work experiences. Schneider's model met this concern by providing students with practical work experience.

Schneider is now lauded as "an inspired innovator in American higher education" and his educational concept is considered revolutionary (Wilson, 1971, p. 5). Schneider's idea prompted a revolution in learning both in the classroom and in the workplace. This

revolution resulted from his recognizing the problems that many students faced while trying to enhance their quality of living. To help students gain work-related experience, he provided benefits for not only students but the institutions and employers as well. As co-op education programs became more popular, schools began modifying the traditional program to fit the particular needs of their students. The definition of co-op education has evolved to become inclusive, creating controversy about how co-op education should be defined.

Structure of the Early Programs

During the early years of Schneider's cooperative education program, other programs were started. Because Schneider's model was effective, those that followed were very similar. The early programs were mainly engineering programs, located in universities, arranged on a weekly changeover system, and lasting for 5 years. The employer was located primarily in an urban setting and within a normal commuting distance. In time, institutions adapted the cooperative education program to suit their particular student population and their local needs.

Soon after Schneider's engineering co-op education program started at the University of Cincinnati, educators from other fields such as business administration and liberal arts realized their students were, in a sense, sheltered from society. These educators saw advantages in giving students the opportunity to experience real-life work and to develop a clearer understanding of society. Consequently, the University of Cincinnati extended cooperative education to the business administration and the liberal arts programs.

Community colleges in the Cincinnati area soon adopted the idea of co-op education, although the idea of co-op education originated at a university. Part-time jobs served as a great incentive for students to enroll and led to an increase in student population. Today, the opportunity to participate in co-op education is offered to all community college students in the Cincinnati area (Grubb & Villeneuve, 1995, p. 2).

The early cooperative education programs that followed Schneider's plan were alternating programs. Two groups of students would change places weekly, such that one group would remain on campus to study, while the other group would travel to off-campus engineering-related jobs. In time, these alternating plans were modified to allow students to spend extended periods either on campus or in their off-campus positions. The periods were lengthened first to 2 weeks, then to 4, then 6, then 10, and finally to full 12-week quarters or 16-week semesters (Wilson, 1971, p. 12). Now, institutions may use a 6-month period or even a full year for co-op work periods. Some institutions even allow students to participate in a nonresident term, which allows their students to leave campus once a year to spend 2 months working with more than one business, industrial, or service organization (Wilson, 1971, p. 12).

Co-op education programs as envisioned and introduced by Schneider were to be extended over a 6-year period. The aim in extending the programs was to make it easier for students to fit their academic courses into their schedules and be able to complete a fair number of cooperative education periods. A number of the early junior college programs were 3 years in length, and, prior to 1960, the established baccalaureate programs were 5 years in length. Because many colleges and universities provide fewer

cooperative education work periods, they do not extend the total length of the college program. Baccalaureate programs continue as 4 years, and junior college programs as 2 years. Co-op education programs began typically as work agreements between the college and local industry because educators thought any other type of work situation outside the local area would not work (Wilson, 1971). Industries were not likely to be located outside of a local commute area. Consequently, the early programs were mainly in urban settings. Today, programs may be outside the country.

Co-op Education as a School-to-Work Transition Program

The conceptual framework (Figure 1.2) reflects the association of co-op education with the school-to-work transition program because the framework shows the same three components, school-based learning, work-based learning, and a connecting activity, as are found in School-to-Work transition programs. Consequently, co-op education is sometimes defined as a School-to-Work transition program.

Stone (1994) defined cooperative education as a "school-to-work system" (p. 3). Hickey (1995) called it "an early form of a school-to-work program (p. 3). The School-to-Work Opportunities Act of 1994 (STWOA) promised up to $300 million in federal funding as seed money for states and local communities to develop statewide programs that combine classroom and work-based learning (Choy, 1994; Congress of the US, 1993a,b). States were encouraged to build on existing school-to-work programs, such as tech-prep (technical preparation), career academies, school-to-apprenticeship programs, youth apprenticeship, business education compacts, and co-op education. Thus, even though co-op education has existed for some time, in 1992, it became defined as a

school-to-work system. School-to-work is much like an umbrella that includes several types of programs to help secondary and post-secondary students obtain knowledge and skills for the job market.

The programs that fall under the umbrella of school-to-work transition satisfy the needs of students who follow very different paths to the workplace. School-to-work students now include those who (a) leave or graduate from college and seek full-time employment, (b) enter the workforce and enroll in employer-supported training, (c) work and go to school at the same time, (d) continue working for several years and then return for post-secondary training, and (e) take part in college programs that integrate school and work despite whether they are planning to continue their education or enter the workplace (Charner, 1996, p. iv).

Co-op Education in the North Carolina Community College System

In the North Carolina Community College System (NCCCS), co-op education is not defined as a concept, structure, or reform but as a program. A program, according to the NCCCS, is a plan of study proposed by one of the 58 constituent colleges and approved by the State Board of Community Colleges. As a "specialized instructional program," co-op education is listed by the NCCCS along with other job training programs such as Apprenticeship, Human Resource Development, Focused Industrial Training, New and Expanding Industry, and Job Training Partnership Act. For this study, three general characteristics are used to define co-op education programs. First, the academic and work experiences are related and integrated so that they are mutually reinforcing. Second, the student is part of a productive work experience so that she/he is

not an observer but is directly involved in work. Third, experienced personnel from both the academic institution and the workplace monitor and supervise the student's work experience (Branton et al., 1990). A considerable amount of coordination between classroom learning and work-based learning is required to make the program successful. Therefore, co-op coordinators from the institutions routinely visit the work sites to draw up written agreements and to implement work- site training plans (Congress of US, 1995, p. 66).

Although the words *co-op education* for some suggest only a work situation, Hutcheson (1996) made an important point: "First and foremost, co-op education is an academic program" (p. vi). Students obtain theory in school that includes critical skills needed in the workplace where individuals practice what they have learned and the practice gives them the opportunity to interact with excellent role models (Branton et al., 1990, pp. 31-40). A program design that provides practice to support learning can take many forms, creating variability. Variability exists in co-op programs to the extent that comparing research outcomes becomes difficult. The North Carolina Community College System graduates are described with respect to the co-op program that existed 10 years ago with the quarter system (Appendix 1).

Variability Results in Varied Outcomes

The conceptual framework (Figure 1.2) depicts the components of co-op education programs, and these components vary from one institution to another. Ricks and colleagues (1990) emphasized that co-op education programs focus on the students' needs. Sovilla (1988) concurred with Ricks and colleagues (1990), stating that co-op

programs are adapted to local conditions and the characteristics of each student body. Adapting to the needs of the locale and student body has resulted in nationwide and worldwide variability in co-op programs. Program variability has been viewed as an advantage because all stakeholders benefit. However, disadvantages may exist because the operating standards for co-op education have not been established. There is a need to clarify the variability in co-op education programs, clarify the characteristics of these components, and define the dependent variables in outcome studies (Fletcher, 1989).

Different models of co-op programs exist nationally and internationally and in high schools, two-year and four-year colleges, and universities. Co-op practitioners, educators, and administrators proclaim the beneficial outcomes of co-op, but to evaluate outcomes and demonstrate accountability, educators must not ignore that programs vary and acknowledge the manner in which they do vary.

Researchers acknowledge the lack of a consensus on the standards for co-op education program design and operation. Pearson (1982) admitted the diversity of operating arrangements or calendars practiced by co-op education students. Sovilla (1988) commented that "our field already has an identification crisis due to the proliferation of models" (p. 144). Heinemann (1988) stated that, except for the Cooperative Education Division of the American Society for Engineering Education and the Canadian Association for Co-operative Education, there are no established certification standards (p. 36).

The literature reflects the variability of co-op education programs, such that when programs are described words like normally, typically, probably, could, might, and may

are sometimes used. Hutcheson (1996) emphasized this point further, stating that "colleges may offer multiple types of co-op arrangement," which can be interpreted to mean that one college may offer more than one co-op arrangement (p. viii). Ricks and colleagues (1990) gave another example, saying, "the program normally commences and terminates with the academic period" (p. 9). Educators acknowledge that variability exists and are critical of some programs promoting themselves as co-op programs. Sovilla (1988) stated that "all programs which alternate work with study are not co-op" (p. 147). Sovilla (1988) raised an important question, "When does co-op become something else?" (p. 144). Answering this question might be accomplished by determining how co-op education programs vary.

Ricks and associates (1990) reviewed various co-op education program types and outlined apparent program differences in relationship to (a) the number of co-op work terms, academic terms, or both, that students could complete, (b) the arrangement or sequencing of work terms with the academic terms, and (c) the degree to which work terms begin and end with the academic terms. Fletcher (1989) identified other ways in which programs vary. First programs may be mandatory or optional, meaning the extent to which participation is required for the completion of the degree. Hutcheson (1998) concurred with Fletcher and added that these variations can occur among departments within colleges or universities. Not all departments make co-op mandatory. Second, co-op programs may be credit or non-credit bearing, which is the possibility of receiving college credit for participation. Third, co-op programs may be structured or unstructured, meaning the extent to which the work experience must be related to the academic field.

be supervised and monitored by a college official, or both. Finally, co-op programs may differ by what year participation is allowed, sophomore or senior. Participation may be allowed at the sophomore level or restricted to senior level students.

The Congress of the US (1995) agreed with other researchers who point out the variability of co-op programs. This variability extends to the degree of coordination between classroom learning and work-based learning. Also, co-op education varies considerably in terms of the students who are served and the program's objectives. According to Ricks and colleagues (1990), if one combines program differences with the variability of distinct students enrolled in the programs, both differences can and do lead to different research outcomes. The variability in outcomes may be even greater than has been documented in the literature.

"Co-op education must be clearly defined to ensure consistent practice, to research the outcome effects . . . to differentiate it from other forms of education and outcomes" and to determine whether an alternate model of experiential education is needed (Ricks et al., 1990, p. 10). Ricks and colleagues (1990) further emphasized this point, saying, "there is no way for us to determine whether a program is co-op education or not, if we do not identify the critical program distinctions" (p. 10).

Why Variability Exists in Co-op Education Programs

One characteristic of the co-op program is that it is student centered and the activities that support the program allow students to direct their learning. The program focuses on the students' needs, which causes much variability in the program (Ricks et al., 1990). In certain situations, there has been a conscious effort to sponsor co-op in

different forms, but, often, the program model adopted was the only practical option for the location and time (Sovilla, 1988). Thus, the variability in co-op programs has been an asset for students, institutions, and employers. Co-op has persisted over the years in part because it changed as the student population changed. Biester (1972) stated that the ways in which schools have modified the traditional format indicate that educators recognize the individualized nature of the learning process.

The variability in the co-op program format has enhanced a college's ability to accomplish its mission. A mission may include building coalitions, establishing public relations, and forming partnerships. If the college's mission could not be accomplished using the traditional co-op format, then the college found ways to make it happen. According to Baker (1994), building coalitions, maintaining public relations, and forming partnerships are all part of the community college's mission to build the community. Leslie (1996) further emphasized the importance of building community by asserting that the community is where learning takes place. Biester (1972) concurred with Leslie, suggesting that some educators recognize that a variety of off-campus experiences can contribute genuinely to a degree program. Throughout co-op's existence, colleges and universities have found that off-campus experiences are valid and valuable additions to classroom learning, especially if the institution has established and directs structured programs.

Most educators, who are also innovators, have come to realize that a standard co-op education program that may be good for one school may not necessarily be good for another (Biester, 1972). The co-op program must be adapted to local conditions, such as

the academic calendar, location, institutional resources, character of the student body, and other factors that make each college or university unique (Sovilla, 1988).

Student Population

Community colleges' primary role is to cater to the community's needs, which includes diverse programming for the student population, whoever that population might be (Sovilla, 1988). In time, student populations, faculty, and the area's economics change.

After the Second World War, the needs of the older student who required financial subsidies caused a change in educational programming (Ricks et al., 1990). Co-op programs began emerging rapidly to fill that need. Co-op programs that differed from Schneider's traditional model were developed to meet local needs in the hope that educational outcomes would not be jeopardized.

During the 1960s and early 1970s, community colleges were growing rapidly, and those that adopted co-op accepted the older traditional model. More diversity in co-op education evolved with the continued rapid expansion in the number of two-year colleges initiating co-op (Sovilla, 1988). With the expansion in the number of two-year colleges came an expansion in the number of non-traditional students. The composition of the student body was becoming less elitist. The new wave of middle-class and working-class college students were eager to participate in co-op and their goals were work and achievement.

Program managers began adjusting co-op programming when they realized the traditional full-time alternating model was not working. Under the umbrella of co-op

education, the parallel and extended day models began appearing in co-op curricula (Sovilla, 1988). These programs were the result of many schools seeking to implement a workable program that would remain within the constraints of local conditions.

Educators attempted to accommodate the change in student population but controversy persisted. For some program managers, being different somehow implied being better, whereas others felt the newer programs were not co-op at all.

Faculty

Fifteen to 20 years ago, during the great expansion in academe, changes were commonplace and faculties were more willing to accommodate co-op education. Hence, establishing a curriculum calendar to accommodate full-time alternating co-op was not difficult. However, co-op program directors in recent years have found that faculties are not receptive to major scheduling changes to accommodate co-op. During the early years of co-op, executive officers in academe were managing the development of co-op and faculty members or non-academic administrators were directing and coordinating the programs, with start-up funding primarily provided by federal grants. Now, fewer colleges are participating in co-op than there were during the 1960s and 1970s, and some co-op supporters feel this reduction in participation results from a lack of support for programs from executives in both colleges and the workplace (Hutcheson, 1995; Mosier, 1990). Sovilla (1988) added, there is a "lack of support for curriculum modification" and "lukewarm commitments from faculty and administrators" (p. 138).

Economics

Some researchers feel the great impact made on co-op's variability has happened because of the change in environmental conditions such as those in economics (Sovilla, 1988; Varty, 1988). Federal support for co-op education started from the efforts of the National Commission for Cooperative Education in 1973 (Wilson, 1988). Because of continued federal and state support, co-op programs varied in response to policies set up by those funding the programs. Federal support improved the program, which led to increased enrollment (Hoberman, 1994). Sovilla (1988) maintained that because the federal government supported co-op education with funding (fuel for diversity), public attention was drawn to the program and institutions could expand their programs. Government funding for co-op has ended. The Higher Education Act Title VIII that served to fund job training, including co-op education, no longer exists (Co-op Bulletin, 1996, p. 2) A shift in funding for co-op programs from federal and state government support to college support may cause programs to vary even more.

Other economic changes have caused co-op programs to vary, especially in the numbers of participating students. During the early years of co-op, few students had options that allowed them to pay for a college education. Co-op became a reasonable and attractive option for financing a college education (Sovilla, 1988). Now, students have several options for financing college, including state, federal, and institutional aid packages. Consequently, some students choose to bypass co-op.

Job market conditions have changed over the past century, such that the number of working persons in the household is now two and not one. These family members are

working full-time jobs, which leads one to imagine that a considerable number of potential co-op jobs has been taken by the increase in the full-time labor force (Sovilla, 1988).

Another recent labor market development that has impacted co-op education and its variability is part-time employment. Over 3.7 million people work part time regularly (Sovilla, 1988). A number of factors have influenced the variability in co-op programs. To explain the program further, co-op must be examined from other perspectives.

Different Perspectives of Co-op Education

Before the researcher can document outcomes, co-op education must be described from different perspectives. There are four main perspectives from which to view co-op education, and these different perspectives lead to the variability in the programs: (a) Partnerships – a three-way partnership, (b) Accountability – who is accountable for what and to whom, (c) Administration – the relationship to how an institution is managed or the manner in which co-op operates, and (d) Program Types – the format of a program (e.g., parallel, alternating).

Partnership

The concepts that define cooperative education are represented by the cooperative education logo found within the conceptual framework (Figure 1.2) As indicated by the triangle in the lower half of the logo and in Figure 2.1, cooperative education is a three-way partnership. The partnership is among the employer, the student, and the institution.

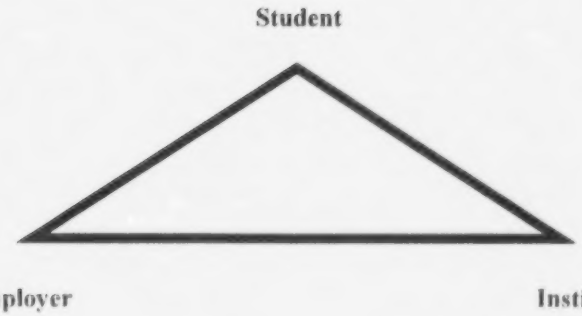

Figure 2.1. Three-way partnership of co-op education.

Notes. Adapted from Tillton Square Community College Handbook, Tillton, NC, p. 11.

The student is at the apex of the triangle because the student is the most important partner, and co-op education caters to the learner's needs. Co-op education is student centered. The employer and institution are equally important. The outer rim of the symbol is a "C," which stands for cooperative. The bar line in the center makes the "C" into an "E," which represents education. The human-like figures standing on top of the bar line represent students getting a balanced education (Tillton Square Community College, n.d.).

Accountability

Loken, Locutt, and Lumsden (1996) suggested that, if educators are going to promote and manage any type of experiential education program, they must first determine "who is accountable to whom," how accountability can be measured, and how accountability information can be used (p. 141).

The stakeholders to which co-op education practitioners must remain accountable are shown in Figure 2.2. The four stakeholders in the education process are (a) government – supplies funding and is satisfied by securing the best value for taxpayers' monetary investment; (b) employers – gain satisfaction from productive employees when they realize value added to their agency by virtue of their monetary outlays (wages); (c) post-secondary institutions – require evidence that their inputs to the co-op program produce acceptable outputs; (d) students and parents – want returns on their investment in co-op, meaning high-skill, high wage jobs (Hutcheson, 1995; Loken et al., 1996).

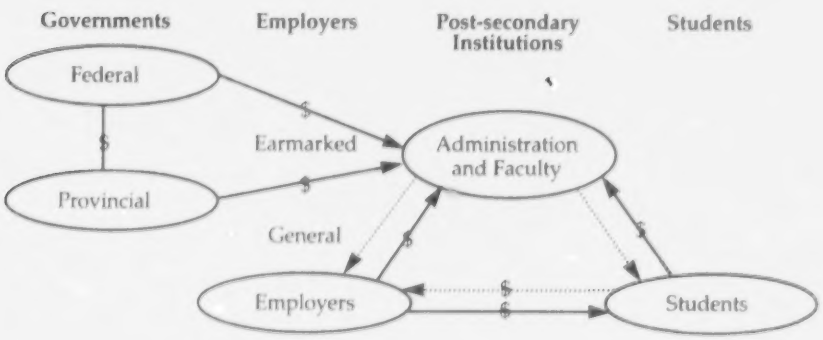

Figure 2.2. Major stakeholders.

Note. Adapted from Loken, Cutt, & Lumsden (1996), Accountability and assessment in experiential education. *Journal of Cooperative Education, 31*(2-3), 140-153.

Multiple stakeholders must account to themselves and to each other (Loken et al., 1996). Administration and faculty represent a more important component than do others in the figure because co-op education would not happen unless administration and faculty positively supported the program no matter how beneficial stakeholders feel the program might be. Having support for co-op at the executive level is imperative if the program is to prosper, and this is the case with the various administrative and leadership levels of co-op education in the present study (Charner, 1996; Mosier, 1990).

When examining co-op education programs and accountability in the North Carolina Community College System, knowing all stakeholders and understanding who is accountable to whom is important (Figure 2.3). In North Carolina, the State Board of Community Colleges is the funding agency for the North Carolina Community College System (NCCCS), which is headed by a system president. The State Board and the NCCCS are responsible for (a) distributing funds equitably and maintaining fiscal accountability, (b) establishing and maintaining state priorities, and (c) approving educational programs and assuring both accountability and quality (U.S. Department of Education, 1991). Of the 58 publicly funded two-year community colleges in the North Carolina Community College System, 22 colleges have co-op education programs and 36 do not. Colleges with co-op programs must document accountability to continue receiving funds. Students, employers, and community colleges in the three-way partnership are all important in documenting accountability. Accrediting agencies in the process of evaluating and improving co-op education can also use the present study, which documents accountability and serves to promote co-op education.

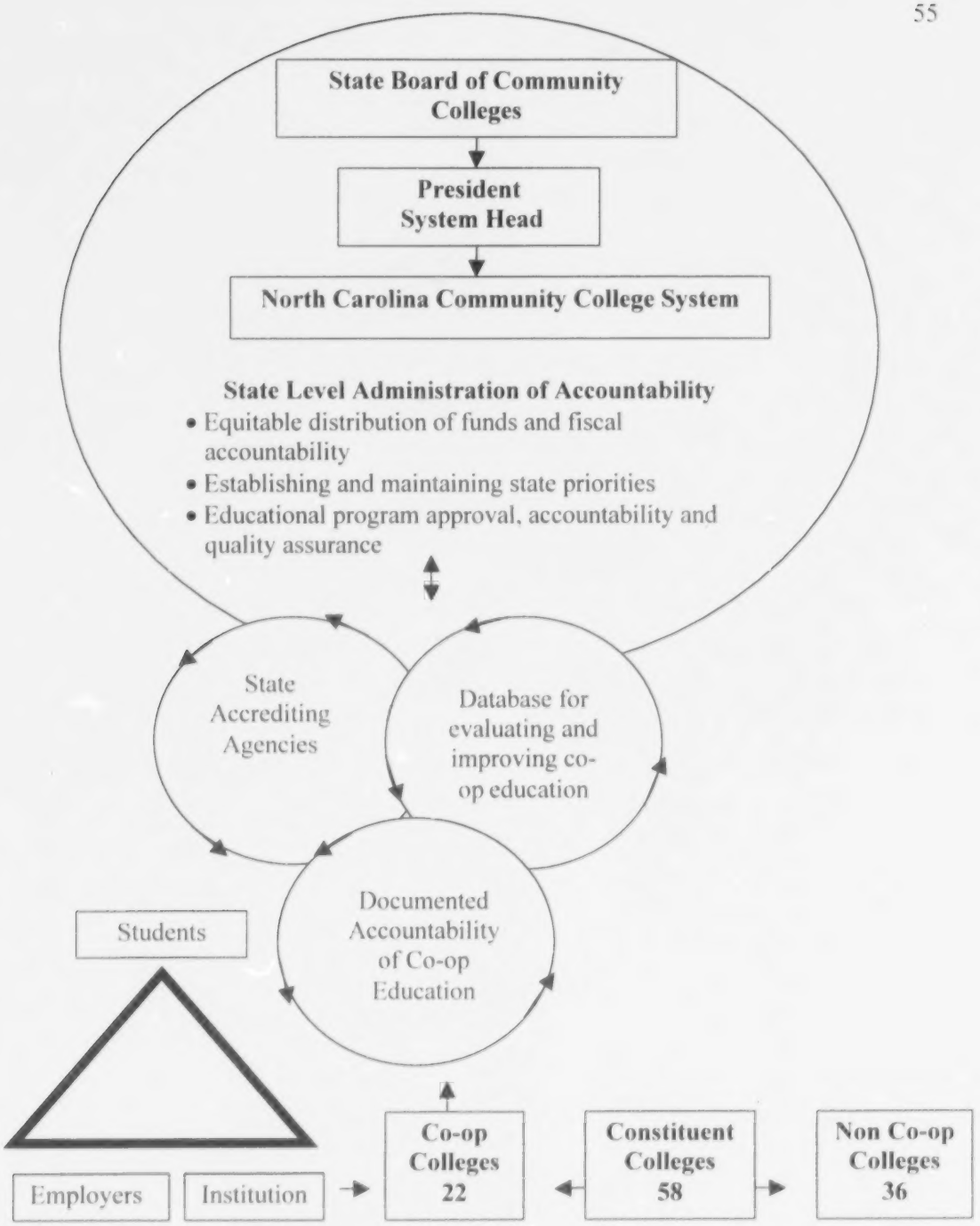
State Board of Community Colleges
President System Head
North Carolina Community College System
State Level Administration of Accountability
• Equitable distribution of funds and fiscal accountability
• Establishing and maintaining state priorities
• Educational program approval, accountability and quality assurance
State Accrediting Agencies
Database for evaluating and improving co-op education
Documented Accountability of Co-op Education
Students
Employers
Institution
Co-op Colleges 22
Constituent Colleges 58
Non Co-op Colleges 36

Figure 2.3. State levels of administration and leadership: Accountability of the North Carolina Community College System co-op education programs.

Synthesized from text: *Cooperative Education Handbook,* Wake Tech Comm College; Harrow, 1978; Owens & Owens, 1981-1982; *US Department of Education,* 1991.

To maintain an approved standing with accrediting bodies, all stakeholders—government funding agencies, faculty, students, and, ultimately, the public, post-secondary institutions sponsoring co-op programs—must remain accountable (Harrow, 1978; Owens & Owens, 1981-1982).

Co-op Education Benefits or Claims that Must Be Documented

Co-op practitioners, educators, administrators, and researchers have made claims concerning the benefits (Figure 2.4) of participation in co-op education programs (Heinemann, 1988; Hutcheson, 1996; Michigan State Department of Education, 1995; National Commission for Cooperative Education, 1994). Yet, some writers confess that measuring these benefits may be difficult. Ricks and colleagues (1990) stated, "while definitive data remain elusive . . . the reports of employers and educators alike confirm a variety of benefits to students" (p. 8). Grubb and Villeneuve (1996) stated, "although the benefits of co-op programs could not be quantified, the educators and employers were virtually unanimous in their support for co-op education benefits" (abstract). Other researchers, such as the National Commission for Cooperative Education, were more definite about the benefits of co-op education. Literature published by the Commission states that co-op education "promotes the lifelong learning process of integrating work and learning, and enhances workplace skills in occupational, analytical and teamwork performance" (brochure). The Congress of the US (1995) further supported the claim that co-op graduates obtain high-wage jobs. "Co-op students tend to have somewhat higher starting salaries in their first job after graduation" (Congress of the US, 1995, p. 68).

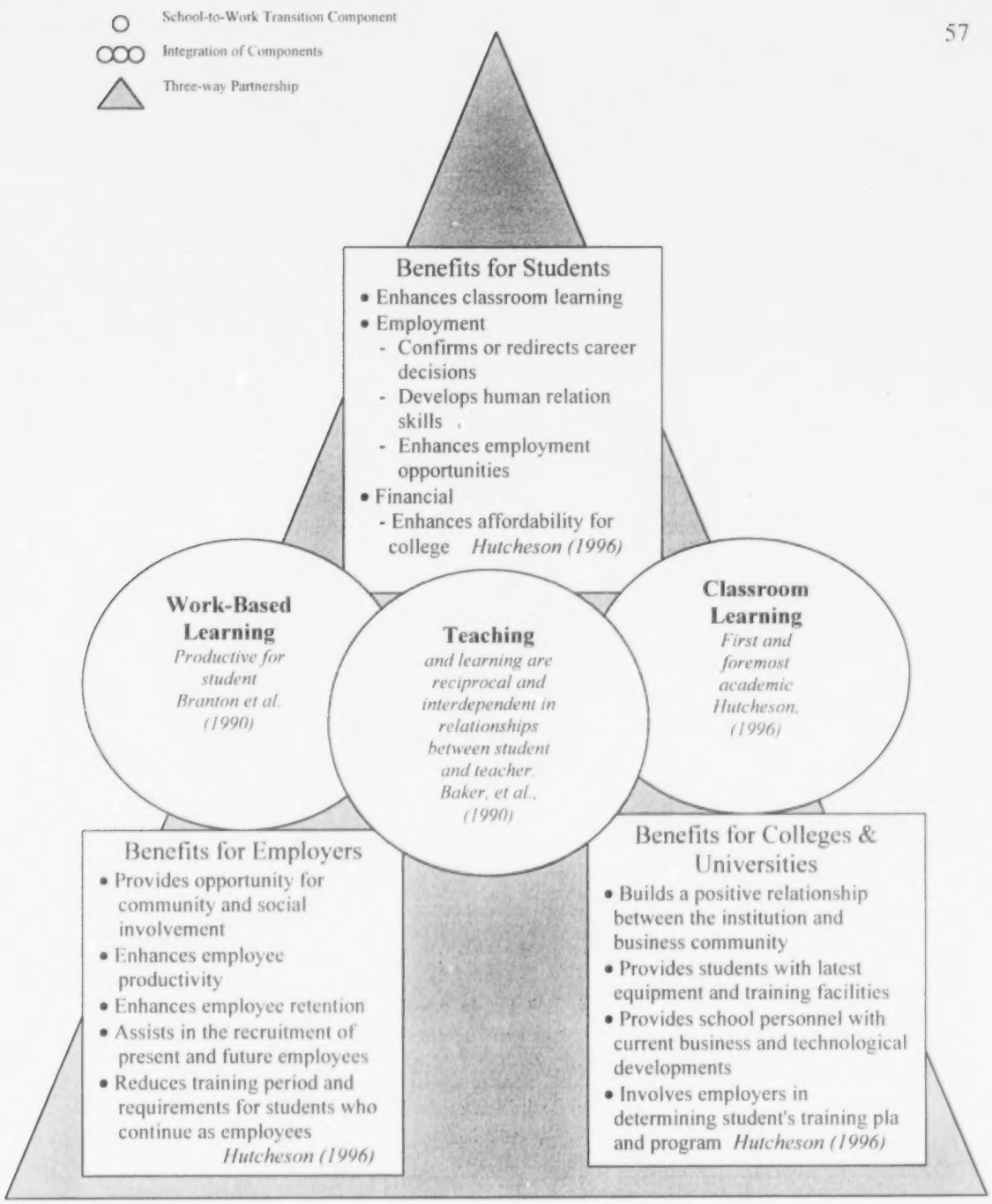
School-to-Work Transition Component
Integration of Components
Three-way Partnership
Benefits for Students
• Enhances classroom learning
• Employment
- Confirms or redirects career decisions
- Develops human relation skills
- Enhances employment opportunities
• Financial
- Enhances affordability for college Hutcheson (1996)
Work-Based Learning
Productive for student
Branton et al. (1990)
Teaching
and learning are reciprocal and interdependent in relationships between student and teacher.
Baker, et al., (1990)
Classroom Learning
First and foremost academic
Hutcheson, (1996)
Benefits for Employers
• Provides opportunity for community and social involvement
• Enhances employee productivity
• Enhances employee retention
• Assists in the recruitment of present and future employees
• Reduces training period and requirements for students who continue as employees
Hutcheson (1996)
Benefits for Colleges & Universities
• Builds a positive relationship between the institution and business community
• Provides students with latest equipment and training facilities
• Provides school personnel with current business and technological developments
• Involves employers in determining student's training pla and program Hutcheson (1996)

Figure 2.4. Model demonstrating the benefits of a three-way partnership in co-op education for students, employers, colleges and universities.

Synthesized from text: Baker et al., 1990; Branton et al., 1990; Hutcheson (1996); Michigan State Department of Education (1995).

In addition "co-op students more frequently reported that their job was related to their career interest (74 percent vs. 43 percent), and that the job was challenging" (Congress of the US, 1995, p. 68). "Students who are facing financial pressure and need income to enable them to remain in college will find that co-op education can satisfy that need" (Heinemann, 1988). Co-op education enhances the affordability for college.

Many benefits of participation are well documented at the four-year and university levels. The question that arises is, if through participation in co-op many students can receive benefits, why has student participation declined to 2% of the school's population for the community college? The answer may lie in that there are two main types of benefits that participants may receive from co-op education.

In the present study, student benefits for co-op education have been categorized into extrinsic and intrinsic benefits, as found in Page, Wiseman, and Crary (1981, 1982). Extrinsic benefits include job factors, such as location, pay, and monetary benefits through employment, increase in retention, higher grades, and higher graduation rates. Intrinsic job factors are considered to be self-actualization such as high self-esteem, confidence, knowledge of career goals and directions, or changes in perception about school and work.

Co-op Demonstrates the Relevance of School and Work

Stern and associates (1992) determined that co-op and non co-op students in a two-year college had different perspectives of their jobs and how the jobs related to their studies. Co-op students more so than non co-op students realized that the information they were studying in college was also provided by their jobs. Co-op students more so

than non co-op students indicated that through working they recognized subjects they liked and disliked, they participated more in classroom discussion and activities, and their classes were more interesting. Co-op education enhanced classroom learning (Figure 2.4). Stern and colleagues (1992) presented data to show that, "for co-op, more than non co-op students, school and work are mutually reinforcing" (p. 44). All responses were significant either at .05 or .01 (Stern et al., 1992, p. 44).

Brown (1984) investigated whether graduates of co-op education, especially those who remain with a former co-op employer, report a greater sense of power in their jobs than do other new college hires. The population was college graduates working on their first full-time job since graduation. Results showed that co-op education graduates have more realistic expectations regarding their first job after college than do graduates of typical degree programs (Brown, 1984). However, participation in co-op education was not a significant predictor of employee sense of power but was a predictor of organizational commitment and job relevance. Data showed that co-op facilitates the transition from student to employee (Brown, 1984).

Co-op Education Increases Retention and Academic Achievement

Co-op education proponents have claimed that co-op education programs increase retention rates (Avenoso & Totoro, 1994; Somers, 1986). Somers (1986) reported a study conducted at Gordon College, a small selective Christian liberal arts college in Wenham, Massachusetts, with 1200 students. Researchers have suggested that demographics may attribute to low retention rates but financial, academic, and personal reasons also contribute to attrition (Somers, 1986). Although improving retention was not the

objective for adopting the program, the results of the study suggested that co-op education improved retention at Gordon College. Seventy-five percent of the co-op students completed their degree at Gordon, whereas 65% of the non co-op students completed their degrees (Somers, 1986). Because grade point averages might be thought to influence retention, grade point averages (GPAs) were analyzed before the co-op experience, and there were no differences between the co-op and non co-op groups. Somers stated it was not possible to "say conclusively that co-op caused higher graduation rates for it participants but these studies suggest a strong relationship" (p. 77).

Other studies have shown that co-op education programs have an impact on academic achievement (Pumphrey & Wessels, 1995). Pumphrey and Wessels (1995) conducted a longitudinal study using the same 1987 graduates of the North Carolina Community College System located in Tillton, North Carolina. Telephone surveys were conducted both in 1993 and 1995. Results showed that co-op participation had a positive and significant impact on GPAs. Pumphrey and Wessels (1995) performed statistical tests that showed significant differences between the co-op student and non co-op students, in favor of the co-op students who obtained higher grades, were more prone to graduate, and finished 2.8 more terms of course work. As well, their results showed the likelihood for graduating increased from 15% to 43% and co-op students were less likely to change majors (Pumphrey & Wessels, 1995).

The Hudson River Center for Program Development (1996) published a list of questions that point to benefits that are or should be derived from co-op education participation:

1. Did students learn important work-based skills?
2. Do students feel more prepared for transition from school to a job and career and further education?
3. Do students feel more confident about approaching the world of work?
4. Do students have a good sense about what they need to do next: more schooling, more experience, learning other skills, etc.?
5. Will students do what they need to succeed in the workplace?
6. Is there increased placement in high-skill, high wage careers?
7. Is there increased job retention, job earnings, and employer satisfaction?
8. Have teamwork skills increased?
9. Are certificates/credentials being increasingly acquired? (Hudson River, 1996, p. 21)

Other researchers have documented findings that relate directly to these questions. Brown's (1984) findings related to questions 2, 3, and 7; Gardner and Motschenbacher's (1993) study was related to question 6; and Pumphrey and Wessels' (1995) findings related to question 7.

The questions above can be answered using outcome studies, and the present study includes questions worded similarly to questions 4-9. For the community college, few studies have answered these questions and documented students' benefits from co-op education participation. Figure 2.4 includes benefits for employers and institutions that participate in co-op education, discussed under community college and co-op education employer sections. To a large extent, benefits experienced by partners in the co-op

education triangle depend on the type of community college executive leader in administration (Charner, 1996).

Administration

Administration is defined here in relationship to how an entity is managed, how it is directed, or the manner in which co-op education operates. Defining how the program is managed determines which individuals perform what tasks and who is responsible for specific program areas.

Before the great growth of co-op education during the 1970s, colleges and universities chose either one or the other, the centralized or decentralized format. According to Ryder and colleagues (1987), by the 1980s, 62% of all US programs were organized on a combined centralized/decentralized format. This change in the organization of co-op education programs occurred as institutions began awarding academic credit for co-op education and these credits appeared on student transcripts. Therefore, accountability became more of an issue and the process became more demanding for the coordinator. With a combined system, coordinators, job developers, or both now find appropriate work assignments for students, counsel them with regard to assignment possibilities, make sure they have jobs, and visit them at the job sites as part of the centralized system (Ryder, Wilson, & Associates, 1987). Due to the high visibility of the co-op education central staff, the students are clear on where to go for information about their jobs. In this way, the office is more accessible to the community and students. Teaching faculty are now used part time to provide students with counseling in their specified academic areas. While functioning in the decentralized system, faculty

members help students to relate their co-op education job to their academic majors and counsel them on matters of receiving credit for their experience. With the decentralized system, co-op education duties are shared between the program director and the full-time or part-time faculty members. Student learning is enhanced when faculty are involved in program coordination, the job matching process, and student recruitment.

In terms of documenting accountability and promoting co-op education, the type of administration is important because it determines who coordinates the program and monitors the students' work experiences. The type of administration determines whether top executives manage the program and monitor the work experience, leaving out the faculty entirely, or the executives manage the program and the faculty monitors the work experience. The latter plan leaves top executives with little or no knowledge about the work experience.

Charner (1996) defended the position that support for co-op education is needed at the executive level:

> Where school-to-work finds an advocate at the executive level, the reform is more likely to take root throughout the educational system. Where that advocacy at the executive level is absent, school-to-work is likely to remain a tenuous and fragmented activity, however strong the support from other sectors. (p. xii)

Centralized vs. Decentralized Plan

Whether a community college decides to use a centralized or decentralized co-op education administrative plan, input from department heads and faculty is imperative to make a successful co-op program (Charner, 1996; Mosier, 1990). The more faculty input,

the more likely classroom learning will reflect the workplace, which is a primary objective for co-op education experience. Within the North Carolina Community College System, 18 community colleges reported data to the National Commission for Cooperative Education (Hutcheson, 1996). Of those community colleges, 12 schools had adopted the centralized type of administration, 2 had adopted the decentralized, 3 schools had adopted a combination of the centralized/decentralized plan, and 1 school did not indicate its administration type. In contrast to the national trend that 62% of schools have centralized/decentralized administrations, only 17% of colleges in the North Carolina Community College System have adopted the centralized/decentralized administrative format (Appendix 1). A high 67% of the colleges in the NCCCS have centralized administrations, and 11% of the colleges have decentralized administrations.

The hierarchical design of a cooperative education program is determined greatly by whether that college has a centralized or decentralized structure, which is described here as Options A, B, or C (Figures 2.5, 2.6, and 2.7, respectively) (Beilby et al., 1980). Advisory committees, created to meet both the institution's and community's needs, are other important organizational components of the cooperative education program. The centralized structure of the cooperative education program includes Options A and B, whereas Option C is a decentralized structure. In Option C, the co-op coordinator does not report directly either to the Vice President of Academics or the Vice President of Student Affairs.

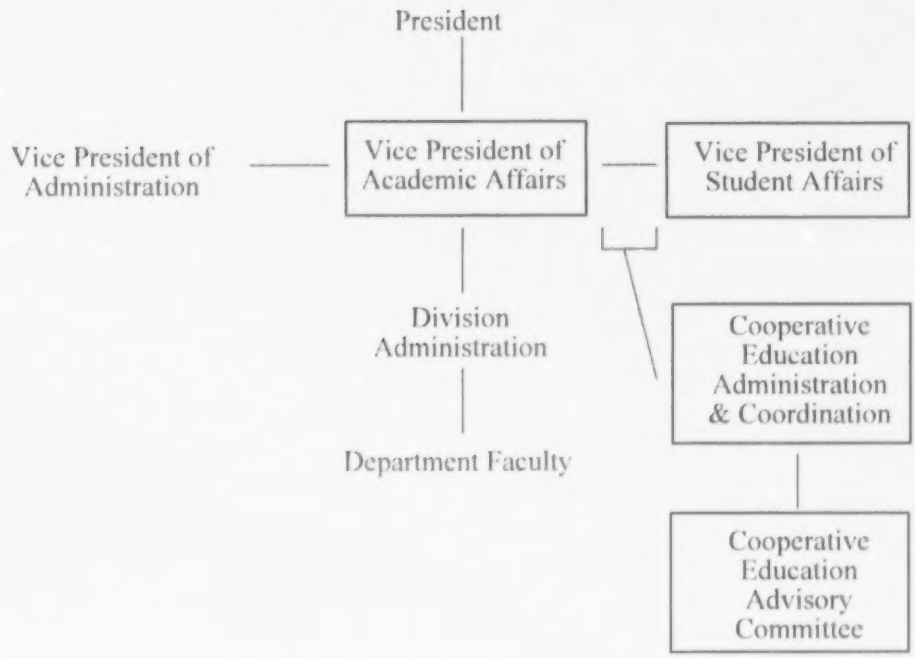

Figure 2.5. Option A - centralized administration and coordination.

Note. Adapted from Beilby, A., Edsall, A., Confrey, J., Gomer, A., Harrington, P., Mann, B., & Vitale, P. (1980). Cooperative Education in 2 yr. Colleges. Guidelines for program development. Research Public. 80-8. Ithaca, NY: (ERIC Document Reproduction Service No. ED 217 179) p. 19.

Individuals primarily responsible for the programs are depicted within rectangles (Figures 2.4, 2.5, and 2.6). Options A and B require the cooperative education director to report to the Office of Academic Affairs or the Office of Student Affairs, a relationship that advantageous in providing a close connection to administrative procedures by emphasizing the program's academics. Reporting to the Office of Student Affairs means

that the coordinator has direct contact with placement, counseling, financial aid, and other student services that enhance the day-to-day coordination of the duties the cooperative education personnel perform.

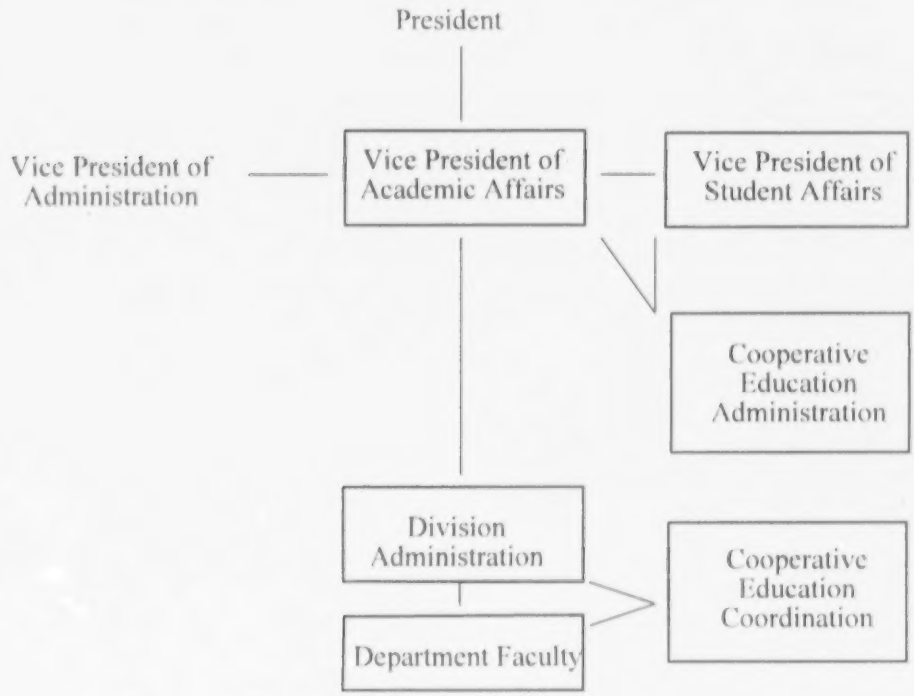

Figure 2.6. Option B - centralized administration, decentralized coordination.

Note. Adapted From: Beilby, A., Edsall, A., Confrey, J., Gomer, A., Harrington, P., Mann, B., & Vitale, P. (1980). *Cooperative Education in 2 yr. Colleges. Guidelines for program development.* Research Public. 80-8. Ithaca, NY. (ERIC Document Reproduction Service No. ED 217 179) p. 19.

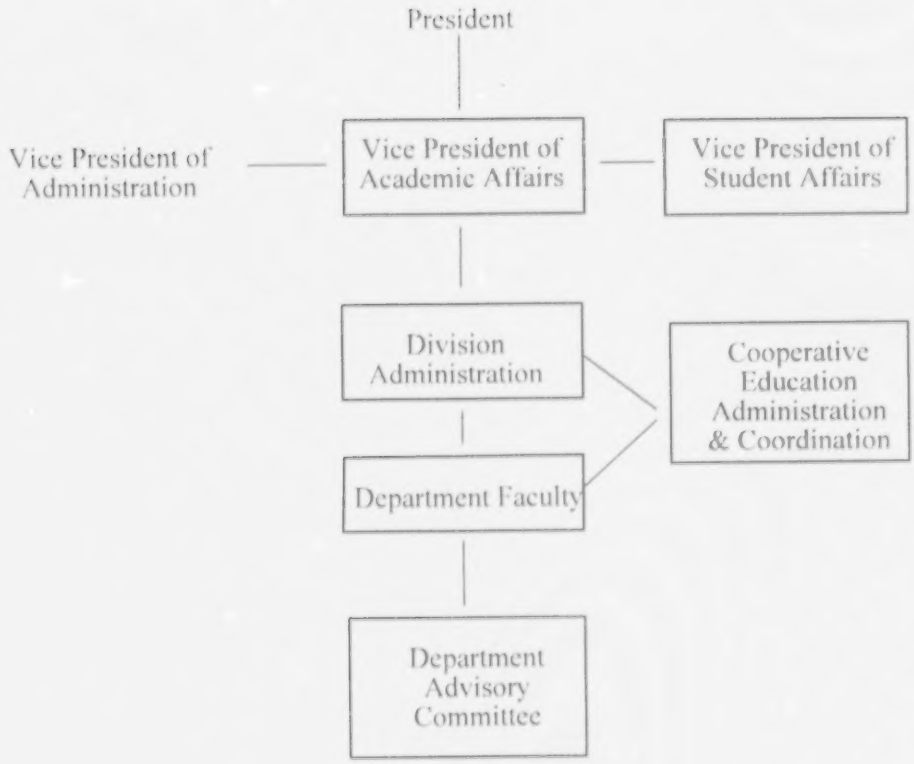

Figure 2.7. Option C- decentralized administration and coordination.

Note. Adapted From: Beilby, A., Edsall, A., Confrey, J., Gomer, A., Harrington, P., Mann, B., & Vitale, P. (1980). *Cooperative education in 2 yr. Colleges. Guidelines for program development.* Research Public. 80-8. Ithaca, NY: (ERIC Document Reproduction Service No. ED 217 179) p. 20.

The location of the cooperative education office, whether in the Department of Student Affairs or in Academic Affairs, should reflect the college's philosophy and policies. Wilson (1985) stated:

> It is reasonable to hypothesize that programs attached to academic affairs are perceived more often as integral to the curriculum than are programs linked to

> student services and hence, receive greater support and encouragement from faculty, which is translated into increased student participation. No matter the organizational structure, the cooperative education director should develop and maintain an effective working relationship with the faculty and staff of both offices. (p. 7)

The administration and coordination of the cooperative education program in Option A is maintained in one unit, and the director/coordinator reports to the Vice President of Academic or Student Affairs. Maintaining both administration and coordination could be considered an advantage but, in this plan, departmental faculty have no vested interest, which is a disadvantage. Therefore, cooperative education coordinators should always seek input from faculty members.

The administration and the coordination of the cooperative education program in Option B are separate and are not contained in one unit as in Option A. The Director of Administration of the program will report to the Vice President of Academic or Student Affairs and will maintain close liaisons with department heads and faculty. The division administration and the faculty perform duties of administration and coordination of co-op education program. While students are on work assignments, faculty members coordinate and monitor their work. The big advantage to Option B is that the lines of communication remain open between the Vice Presidents, the coordinator, and faculty, so that all individuals in the organization have input into how the program is managed. When faculty are involved in the coordination of cooperative education, classroom instruction will probably relate better to what students will learn in the workplace. If faculty

members are involved in program coordination, they can more easily stay abreast of current practices.

Option C is much like Option A in that the administration and coordination of the program is contained in one unit. However, the division staff, department faculty, or both will handle the responsibility of administering and coordinating the cooperative education program. Beilby and colleagues (1980) emphasized the role of cooperative education at the community college and stated that Option C is a good option for two-year colleges with limited resources for co-op education. Because faculty coordinators monitor students' work experiences, faculty members become very committed to the program's goals. This option's major disadvantage, according to Beilby and colleagues (1980), is that it may increase competition among different departments, leading to a division of efforts. In some cases, competition among the departments could serve as an impetus for faculty to work harder for their respective students.

The hierarchy of the co-op education programs has been presented by discussing the centralized or decentralized programs. However, little has been said about the numbers of college and university directors reporting to vice presidents of academic or student affairs, or how many programs are actually monitored and coordinated by division heads and faculty. Ryder, Wilson, and associates (1987) reported that, with the exception of 7%, all co-op education programs in the US had a director, and those that did not were those managed within a specific academic department. Forty-four percent of the programs with directors reported to the chief academic officer of the institution, the academic vice-president, provost, or dean of instruction, and 17% of the directors

reported to the chief student affairs officer (Ryder et al., 1987). Ryder and associates (1987) reported very few cases in which the co-op education director would report to the president, the dean of continuing education, or the director of career planning and placement.

Advisory Committees

Advisory committees are an important part of the co-op education program because they offer the college a way to partner and to gain advice and counsel regarding the concerns of those involved. Although Heermann (1973) listed several committees, (a) central coordinating advisory committee, (b) steering advisory committee, (c) program advisory committee, (d) co-op education advisory committee, and (e) co-op education task force advisory committee, the researcher did not suggest that all committees be used by any one college. Each college should give careful consideration to those committees that fit its needs.

These committees may vary in the objectives for which they were appointed and in those who are chosen to serve. For instance, a departmental advisory committee would address the department's concerns, or a co-op education committee might serve to make connections between the college and industry (see Figures 2.4, 2.5, and 2.6). Advisory committees can be comprised of members who are drawn from potential employers, administrations, faculties, local unions, chambers of commerce, and other agencies (Beilby et al., 1980).

In determining whether advisory committees are suitable for a co-op education program, these points deserve special emphasis:

1. The director recruits and recommends members for the advisory committee.

2. Members are officially appointed to the advisory committee by the college president.

3. Regular meetings are well structured. Two per year are planned, with additional meetings only when necessary.

4. Minutes of meetings and official correspondences are kept on file.

5. Advice, suggestions and recommendations are weighted carefully.

6. Members are informed regarding actions taken on their recommendations (Beilby et al., 1980, p. 21).

Program Format

The characteristics of co-op education and the activities that support the program (Table 1.1) have not only contributed to co-op education's longevity, which has lasted 93 years, but also to its variability. Variability has been demonstrated in the different program formats available for students. The important component of the program, work-based learning, promotes self-directed learning, such that the educational experience is tailored to the learner. Tailoring the program to the learner means that schools have adjusted the time allotted to the learning experience. In addition, colleges along with students and agencies are documenting, according to the students' goals and objectives, customized sets of competencies.

Different types of institutions have found that different co-op education formats are more successful than are others. In addition, several variables other than the type of institution determine the format (commonly called model, calendar, etc.). For instance,

the size and location of the college, the type of school term (quarters, trimesters, or semester), the numbers and types of employers, and the school term for which students enroll determines the format that is adopted. Using the resources and environment, each institution must develop its study work calendar to accommodate its unique situation. The type of program may make a difference in the results of the outcomes studies. World Book Multimedia Encyclopedia, (1996) lists four program types, alternating, parallel, field experience, and extended day.

Alternating

The alternating format is considered the traditional model that was designed by Schneider (Knowles et al., 1971). None of the schools in the North Carolina Community College System limits itself to the alternating model (Hutcheson, 1996). However, 9 schools (50%) use the alternating/parallel model (Appendix 1). The alternating model allows the agency to maintain a full-time position and to have two groups of students, in some cases considered a two-person team. Students exchange places during a semester, so that one group is working at a job, while the other is taking classes. Thus, in some cases, a full-time job is covered year round by a pair of students (Pearson, 1982). The alternating model may not always include coverage of a full-time position for a year. Students may work at a full-time position during one term and at the end of the term attend classes full-time. In the Cincinnati two-year colleges, the alternating model is the most common form of co-op program (Grubb & Villeneuve, 1995). A student is enrolled in the Cincinnati system for a 10- to 13-week term and then works with an employer for the same amount of time, with the opportunity to repeat the cycle two to six times (Grubb

& Villeneuve, 1995). Within two of the Cincinnati two-year colleges, Ohio College of Applied Science and Cincinnati Technical College, practically all the students who participate in co-op education follow this pattern (Grubb & Villeneuve, 1995).

Opinions of alternating model.

Grubb and Villeneuve (1995) used the Cincinnati Community College System co-op education program as an example and voiced the opinion that the alternating model was ideal for their community college system. Community college researchers have not published definitive data proclaiming that one co-op education model is more effective than are the others (Grubb & Villeneuve, 1995). Nevertheless, Grubb and Villeneuve (1995) felt that the alternating co-op programs that are managed by employers with a "grow your own" philosophy are of better quality than are the parallel programs (p. 9). Grubb and Villeneuve (1995) also explained that employers who operate the parallel programs are those who more often view co-op students as a "source of well-trained inexpensive labor" (p. 29). Arguments can be made for the alternating programs, which are thought to provide more in-depth experiences: The hours and continuity of work are much like those of a regular employee, so they are considered closer to the real world of work; employers are more likely to emphasize the long-term benefits of the educational experience; the focus of the co-op experience is more student centered; and the agency's welfare is considered in a very long-run sense. Employers using the alternating format, alternate students on a full-time schedule, are more likely to rotate students through a series of positions because students have more hours in the day than those in the parallel format. Employers also schedule additional activities for students, such as seminars,

workshops, and so forth (Grubb & Villeneuve, 1995). Grubb and Villeneuve (1995) stated that, because the alternating format does not split the student's focus between school and work, it is considered a more intensive learning experience. Employers differ in their reasons for participating in co-op education. Those who look at co-op students as potential employees tend to prefer alternating co-op arrangements that give the employers maximum exposure to students' abilities to conduct on-the-job tasks (Grubb & Villeneuve, 1995).

Parallel

Parallel format refers to the positioning of study and work parallel with each other. Within the North Carolina Community College System, 8 schools (44%) use the parallel model (Hutcheson, 1996) (see Appendix 1). Students in the co-op education program following this format attend classes and work during the same term (Pearson, 1982). Even though nearly all the students in Cincinnati's two-year college system participate in the alternating format, the majority (90%) of the students in Dayton's Sinclair Community College follow the parallel format. Using the parallel format, the students usually attend college in the morning and work during the afternoon.

Opinions of parallel format.

Coordinators do not welcome partnerships with all employers. Some prospective co-op employers look for "inexpensive employees and short-term quick labor . . . or go-fers," according to Kathleen Brown, the University of Alaska co-op coordinator (Sakamoto, 1993). Employers who look at co-op students as a source of efficient inexpensive labor often use parallel programs (Grubb & Villeneuve, 1995; Heinemann,

1988). Therefore, the practice of rotating around positions and providing associated education is much less common. Grubb and Villeneuve (1995) agreed with Heinemann (1988) that the characteristics of students attending community colleges, older non-traditional students with financial needs different from those of traditional undergraduates, have greatly influenced the implementation of the parallel format. The non-traditional student is served better by the parallel format, which originated with the community college, because students can earn a salary and attend classes at the same time (Heinemann, 1988).

Field Experience

Field experience appeared to be a format used during the 1960s and 1970s at a time of co-op programs' early expansion. None of the colleges within the North Carolina Community College System is currently using the field experience format.

The field experience became popular because the traditional co-op model established by Schneider restricted formats, such that the work-based learning had to be closely tied to classroom learning (National Commission for Cooperative Education, 1994b). To participate in co-op education, the student's academic area of study had to be matched to an existing job. Because schools did not want their students to be deprived of a learning experience in the real world of work, these schools began altering the traditional co-op program.

The field experience became defined as an off-campus experience that allowed the student to leave campus for a specified time, usually a school term. The policies of the field experience varied according to the institution's characteristics (Biester, 1972).

Elliott (1974) described field experience as a "practicum," when used in human services. The practicum included a sequence of activities that afforded students progressive exposures aimed to working with people. During the late 1960s, the students entering college were not interested in being placed in what was called the "establishment," rather they wanted job experiences that allowed them to work with people of the community, especially the disadvantaged (Biester, 1972). Elliott (1974) explained that, through the field experience, students could test for themselves their intentions in human service while in the early stages of their academic programs. During the early years of co-op education, opportunities for co-op positions may not have existed but, today, not many academic fields exist for which there are no work-based learning experiences. Because co-op education had its roots in a technical field (engineering), co-op positions in liberal arts were slow to catch on. Expressing the situation in academe during the 1960s, Biester (1972) stated that "traditional co-op programs [were] too narrow in their philosophy and implementation to serve the needs of diverse student bodies, especially in liberal arts colleges" (p. 54). It is not surprising that schools began modifying the traditional model of co-op education, resulting in many blends of in-class and out-of-class experiences (Heermann, 1973).

Kalamazoo College in 1962 tried another early modification of the field experience, and other colleges followed suit with their own variations. Kalamazoo instituted a Career and Service Quarter, allowing seniors to determine an individualized project, arranged by the college, that they wanted to pursue off-campus (Biester, 1972).

This arrangement was very much like the field experience arranged by Elmira College that required students to write a major paper worth additional academic credit.

New College of Sarasota in Florida started similar programs. However, New College promoted its program by rebating up to $600 from tuition fees for any approved off-campus program (Biester, 1972).

Coe College promoted its off-campus field experience by ensuring that the field experience did not delay graduation. The institution reduced the graduation requirement by four courses instead of granting academic credit for the off-campus experience (Biester, 1972).

In 1964, Beloit College established a required off-campus experience that included overseas placement (Biester, 1972). Despite the field experience requirement, placements could be related to studies, career interests, personal interests, or of little relevance to the academic program (Biester, 1972).

Extended Day

The co-op education extended-day or evening program accommodates students who cannot participate in regular co-op because they work full time during the day or on rotating shifts (Heermann, 1973). The student's job becomes his or her co-op experience and evening hours are spent enrolled in courses.

Employers who are flexible in scheduling its employees are necessary to make the extended-day program successful. Some firms grant students release time during the day to take courses. The employer feels the programs are valuable to them and to the employee. On the other hand, some colleges require students to take classes in the

evening school. To establish the extended-day program, which allows a job rotation plan for the student, the college coordinator must work closely with the employer and the student. This relationship is necessary to establish career outcomes for the student so that program objectives are achieved.

Heermann (1973) felt that in spite of the program being relatively new, movement toward extended-day programs would be rapid. However, not much exists in the literature concerning the extended-day program. At the time of Heermann's publication, the five-college consortium in California was offering such a plan, and approximately 45% of the more than 4,000 students enrolled in co-op were in the program (as cited in Bennett & Redding, 1972a,b).

Sovilla (1988) and Varty (1988) believed the extended-day format might be the answer to meeting future needs of the dislocated worker who can benefit from structured work experience but who cannot afford alternating co-op because of family obligations. Some program managers changed from the traditional full-time alternating model when they observed that the extended-day format did not accommodate certain populations (Sovilla, 1988).

Co-op education has been defined here in all its variability. Examination of the components of co-op education reveals how they are linked in a manner that reinforces each component.

Components

The co-op education components, program characteristics, and activities that support those characteristics support the theory and hypotheses put forth by researchers

that co-op graduates' experience advantages over the non co-op graduate, such as gaining high-skill, high-wage jobs. The components of co-op education are expounded upon here, and the researcher shows how the experiences and activities of co-op education encourage graduates to seek additional education and obtain salary gains.

The components of co-op education are linked numerically within the conceptual framework (Figure 1.2) to indicate the starting and ending points of the learning experience, rather than as input and output points of the experience. Reputable sources, Congress of the US (1995), Hamilton and Hamilton (1997), Hutcheson (1996), and Ricks (1996), maintain that co-op education prepares graduates for high-skill, high-wage careers. Workplace changes dictate that workers seek additional education, and co-op education prepares graduates to meet this challenge. These components represent the concepts and variables that suggest interrelationships in co-op education. The experience starts in the classroom, where the instructors, the curricular structure, and the community college campus environment ensure contextual education. The community college and the co-op employer form a partnership with each other and the student to ensure that the work-based learning experience focuses on the students' needs and is integrated with classroom learning. The community college co-op official works with the student and employer to keep the student's needs as the focus of the partnership. The result of the three-way partnership between the student college and employer is establishing a set of written learning objectives for the student to accomplish (Charner, 1996; Dallas County Community College District, 1983; Heinemann, 1988). An essential component of the three-way partnership is teaching. The teachers, found in the classroom and the

workplace, enter into a reciprocal relationship with the students. Learning is enhanced because students receive direction and structure through their role models. The student's first encounter with role models is in the classroom where he or she obtains the theoretical basis of the subject area. Acquiring background knowledge in the subject area before beginning work is essential.

Classroom Learning

On the basis of the characteristics of classroom learning and the activities of the program within the classroom (Table 1.1), students who attend a co-op school as opposed to a non co-op school are more likely to be motivated to learn (Congress of the US, 1995; Hamilton & Hamilton, 1997; Mueller, 1992; Pumphrey & Wessels, 1995). The conceptual framework (Figure 1.2) depicts the classroom learning as Component I, because students first develop a knowledge base before going to the work site. The work-based learning reinforces the classroom learning because students use what they learned in the classroom at the work site.

At least four characteristics of classroom learning and other components within a co-op school have been shown to influence students (Table 1.1). First, the curriculum is contextual, meaning it is related to real-life experiences and emphasizes practical circumstances (Mitchell, 1977; National Commission for Cooperative Education, 1999). The classroom learning activities develop into research projects the student initiates from being inspired by workplace challenges (Charner, 1996). Second, the classroom learning experience encourages the learner to change the manner in which he or she makes meaning from the experience, which is transformational learning (Ricks, 1996). The

teachers learn from the students and the students learn from the teacher and from each other, which is reciprocal learning (Baker et al., 1990). This reciprocal learning is enhanced through practice laboratories and technology use (Ricks, 1996). The theory-based classroom learning is tailored to the learner as all adult learning should be and is therefore self-directed (Charner, 1996).

Contextualized Curriculum

Table 1.1 depicts classroom learning as including a contextualized curriculum. A contextualized curriculum emphasizes the context or practical circumstances within which a student might apply the skills or knowledge (National Commission for Cooperative Education, 1999). Co-op experience activities that support the contextualized curriculum include (a) participating in academic discussions that focus on work-site issues, (b) listening to guest speakers from local businesses, (c) touring local industries, (d) using literacy materials from the workplace in the classroom, and (e) designing classroom activities around projects. Through the co-op education experience, student learning is enhanced because the curriculum is contexualized.

According to some researchers (Charner, 1996; Stern et al., 1992), the contextualized curriculum is more appropriate because co-op more so than non co-op students/graduates see a better connection to school and work. Some results that suggest co-op graduates see a better connection to school and work were demonstrated in a 4-year study of STW (School-to-Work) graduates. A few years after graduation, graduates were more likely to be employed, more likely to access post-secondary training, and had

higher incomes and professional standing than their peers who did not experience STW (Charner, 1996).

Stern and colleagues (1992) surveyed students in two-year colleges, some of whom were in co-op education. Co-op students were far more likely to say that their jobs provided information about things they were studying in college and gave them a chance to practice what they learned in school. They also indicated that they contributed more in class because of what they learned at work (Stern et al., 1992).

The previously described studies conducted by Stern and colleagues (1992) and Charner (1996), using two-year and four-year students and graduates, suggest that learning is made more relevant by contextualizing the curriculum because experiences in the real world of work are used as examples. Contextualizing the curriculum in co-op education gives students practice in recognizing the similarity of situations in the classroom and in the workplace. If students can develop thinking skills in this manner, they can easily transfer skills from one setting to another (Branton et al., 1990).

Educators are being pressured to find new and better ways to educate students and prepare them for work because international trade and technological advances have expanded and altered the type of work and the skills that are required to perform adequately in today's workplace (Ricks et al., 1990). Gardner and Tyson (1994) and Varty (1994) concurred that job loss, job reassignment, and company budget cutbacks along with longer life spans have increased job competition, resulting in increased levels and types of employer's investment in employee training (Vaughan & Berryman, 1989). Zdorkowski and Thomas (1984) suggested that the keys to success in the new

millennium will be an adequate foundation of skills, continuous learning, and a willingness to alter career goals. Educators must now encourage students to predict and master those skills that may be necessary to compete for the high-skill, high-wage jobs of the 21st century.

Contextualizing the curriculum has done much to turn classroom learning away from lecture and passive learning in which students have no part to play (Ricks et al., 1990). Simulating real-life situations in the classroom opens up new avenues for learning. Charner (1996) explained three major approaches for contextualizing education. First, the Functional Context Literacy approach recommends bringing workplace reading material into the classroom so students can simulate tasks performed at work. This method emphasizes the ability to solve problems related to specific jobs and to read and understand the printed material. Second, the Defining and Teaching Generic/Thinking Skills approach focuses on teaching thinking skills, so that students can transfer these skills from one setting to another. Finally, Motivation Theory suggests that educators must make employment part of the student's vision. In this way, students develop reasons for learning and are motivated.

Charner (1996) reasons that not only should the content of classroom material be changed but the manner in which material is taught or presented. Teachers should be trained to begin turning over tasks/projects to students by using the apprenticeship approach to teaching (serving as role models, supporting students, and developing a knowledge of material with which the students have become familiar). Building on material with which students are familiar encourages students to confer with each other

(Charner, 1996). Hence, learning takes place in families, community schools, and workplaces rather than just in schools. The first legislation to affirm this was the School-to-Work Opportunities Act of 1994 (Congress of the US, 1993a,b; Halperin, 1994). Leslie (1996) agreed with Charner and predicted that learning will become more of a social activity rather than an individual process because people learn better that way and their careers evolve in the same manner.

Transformational Learning

Table 1.1 depicts transformational learning of co-op education as espoused by Ricks (1996). Classroom learning at a school that offers co-op education includes transformational learning, which digs down to the roots of assumptions and changes the way students make meaning from experience (Ricks, 1996). Students may be involved in activities, such as being asked to analyze the assumptions in course work against assumptions at the work site and determining the connection between the two.

The focus of transformational learning is the "making sense" of an experience (Courtenay, Merriam, & Reeves, 1998, p. 65). Transformational learning is something more than memorizing a set of facts or developing a new skill. Transformative or transformational learning produces more far-reaching changes in the learners than the present orientation and learning climate today, which is more about content than actual application (Courtenay et al., 1998; Hoerner, 1994). Transformational learning shapes people and creates changes that significantly impact the learner's future experiences (Courtenay et al., 1998). Courtenay and associates (1998) distinguished learning from everyday learning by presenting an analogy: "Normally when we learn something, we

attribute old meaning to a new experience, but in transformative learning, we interpret an old experience (or a new one) from a new set of expectations" (Courtenay, et al., 1998, abstract). Therefore, people reflect upon assumptions, biases, beliefs, and eventually develop the new set of expectations or manner of viewing situations and concepts. Changes in the way people make meaning of situations and concepts in life experiences constitute adult learning. Courtenay and colleagues (1998) contended that people restructure meaning by taking apart and putting together the structures that give their lives meaning progressively or step by step. In this way, people transform their sense of self, worldview, and perspective of life.

Co-op education is designed for those who do not learn by memorizing. According to Hudson (1994), president of the American Vocational Association, the movement to integrate classroom learning and work-based learning affirmed that "learning by doing is [the] preferred method by students whose learning style is not attuned to listening, reading, and memorizing" (p. 7).

Reciprocal Learning

Technology and alternate models.

The conceptual framework (Figure 1.2) depicts classroom learning as involving laboratories and equipment that make the learner aware of resources, such as those related to technology. Co-op education is enhanced by using advanced technology and alternate models of delivery with tools such as the computer and those related to telecommunication industry. Leslie (1996) stated that learning is becoming "just in time, accessible from multiple approaches and sources and contextually applied" (p. 5).

Technology opens endless opportunities to teach anywhere, at anytime, and many ways, such as satellite links, e-mail, computer technology, rapid transit, phone conferences, and modems. Reciprocal learning is enhanced by using learning resources because the technology use helps remove the barriers of time, distance, and mode of delivery. The presence of co-op programs on a college campus allows the institution to partner with employers who supply the college classroom with the latest equipment. Furthermore, co-op employers are a source of advice in using this technology. According to the *Report of the Commission for a Nation of Lifelong Learners* (1998), technology "offers the potential to reinvent the relationship between learner and teacher" (p. 23). The use of laboratories and equipment helps the learner use multiple learning resources and to engage in reciprocal learning relationships (Ricks, 1996).

Social nature of reciprocal learning.

Classroom learning within the co-op education college is enhanced because learning is reciprocal. Reciprocal in this sense suggests "that people influence their environment, which in turn influences the way they behave" (Merriam & Caffarella, 1991, p. 135). When people interact socially, much learning takes place. Co-op education proponents theorize that students engage in reciprocal learning relationships with teachers (Ricks, 1996). The teachers learn from students and the students learn from the teachers and each other (Baker et al., 1990). If equated to social learning, reciprocal learning might be considered observational because learning takes place in a social setting by observing other people. However, learning does not take place by observation

alone. Actions must be imitated and reinforced. The consequence of this observation is that behavior is changed (Merriam & Caffarella, 1991).

Self-Directed Learning

Self-directed learning is part of classroom and work-based learning. Garrison (1997) defined self-directed learning as "the ability to learn on one's own" (p. 19). The self-directed learning process does not eliminate the trainer but involves a trainer who is more of a facilitator than a teacher. The presence of a facilitator rather than a teacher encourages the "self directed learner to be a critical thinker" (Garrison, 1997, p. 30). Being able to think critically, the co-op student should be able to diagnose needs, develop objectives, design learning experiences, find resources, and evaluate learning outcomes for himself or herself, just as any self-directed learner would (Hatcher, 1997).

Co-op education learning experiences are grounded in adult learning theories for the classroom as well as the work site. Therefore, the educational experience is tailored to the learner (student centered) because adult learners today have different learning styles than adults of yesterday or the future. The lives of adult learners are complex, with components that may add to or distract from learning. Adult learners learn best from experience and learn slowly but retain learning longer. Hence "different learning plans are required in order to best serve different cultural and socioeconomic groups, and genders" (Keeton, 1998, p. 8). The interaction among learners has a tremendous effect on "what is learned, the rate of learning, and the degree of its retention and effective use" (Keeton, 1998, p. 8). Self-directed learning appeals to the adult learner because it puts the

learner in control of deciding what to learn and how to learn it. Some co-op programs encourage students to find their own work experience.

Leslie (1996) agreed that co-op is both self-directed and reciprocal. Co-op education promotes self-directed learning so that students utilize resources that in turn drives the learner to enter into a reciprocal learning relationship with other learners and the teacher (p. 5).

Community College

The community college works in partnership with the students and the employer to make sure that the program characteristics and the activities that support the program (Table 1.1) help the students achieve their career goals. Classroom material must present the theoretical background that students need for the workplace. Advisory committees (Figures 2.5 and 2.6) are used in designing curricula, and they make college officials aware of a need for new programs that will help employers meet their employees' future needs. On the other hand, when there no longer exists a need for certain programs, college officials know when to adjust enrollments. In the process of determining criteria for co-op participation, such as qualifications, course credit, year of placement, length of co-op work period, and so forth, college officials once again confer with students and employers. Documentation of specific learning objectives for students is necessary for participation in co-op education and aids the institution in making themselves accountable to accrediting agencies.

Curriculum Program Development

Representatives from school and work come together to plan curricula and programs. Employers serve as vehicles to provide faculty with valuable information updates for existing programs and curricula. Because employers have direct experiences with the college students, they are often able to give realistic and useful advice to the college and do so through program advisory committees (Heermann, 1973, p. 81).

Program advisory committee take part not only in structuring the co-op education programs but also in promoting the program's values to the community. The committee also identifies appropriate positions for students, serves as a liaison between the educational institution and the community, secures guest speakers and occupational data concerning the area, develops criteria for evaluating work and study performance, works as a group, combining members' expertise to solve program problems, projects demands for employees, and assesses the success in achieving program objectives (Heermann, 1973). Program advisory committees can also help institutions in securing state-of-the-art technology.

Program advisory committees are usually comprised of 6 to 12 members from appropriate employer–employee groups from different management levels, labor unions, the student body, and representatives of various community and professional organizations. Once the program is well established, two to three meetings per year are sufficient to handle questions concerning program operation.

Community Colleges Adapt to Employment Shifts

Community colleges, more so than four-year colleges and universities, can easily adapt to swings in employment. Community college co-op education programs easily adapt because co-op officials act as "border scouts" for the college, helping their colleagues understand the changes that are occurring, including defining the training strategies best suited to the industrial environment (Varty, 1988, p. 131). Border scouts are of great benefit to teachers because few people in higher education stay current with what is happening in business and industry (Varty, 1988, p. 131) In addition, community colleges have the flexibility to make rapid changes in curricula (Way, 1990). Technological occupations are changing so rapidly that educational institutions are having a difficult time keeping up. Through co-op education, institutions are alerted to demands for new programs based on the employers' needs. Additionally, the colleges' border scouts can survey the colleges' available resources and suggest how industry can best utilize these resources (Varty, 1988).

Employers are represented either on the college's central coordinating advisory or steering committee. The central coordinating committee's purpose is to recognize broad areas of need in education for the immediate community. When necessary, members of the central coordinating committee can intercede if policy changes are warranted for the employment of two-year graduates or they may act to encourage specific communities to adopt co-op education. However, the committee's main mission is to direct the college into new program areas (Heermann, 1973). The central coordinating advisory committee is usually comprised of members of the college's upper administrative hierarchy and the

community's power structure. Committee members (20-40) from a wide variety of occupational fields represent the community's most influential leaders (Heermann, 1973). The central committee handles broad educational needs, but more specific needs are handled by the steering committee.

The steering advisory committee, functioning to advise college personnel on the precise nature and extent of the need for an associate degree program or certificate, administers community surveys and contacts professional and trade groups who are knowledgeable about the area. The members of this committee, which may number up to 25, also have expertise in a specific area.

Programming

Programming can be defined in regard to the students who are served, the numbers of students participating, the course credit received, the year placement begins, the length of the work period, and evaluation. Co-op programs vary widely in the types of students who are served, the emphasis on certain responsibilities of the office, and the extent of the integration of school-based learning and work-based learning. Co-op education at the college and university levels is usually moderately selective, requiring a minimum grade point average.

As previously mentioned, an additional consideration that may be a deciding factor in co-op outcome studies is whether the program is mandatory (required for graduation) or optional (not required for graduation). Although some programs may be mandatory or optional for the students, most programs are optional. The only mandatory

program at a two-year college is found at LaGuardia College located in Long Island, New York, and is mandatory for all full-time students.

Student participation in cooperative education.

The Congress of the US (1995) reported that "one-third to two-thirds of the two-year colleges have co-op programs, but only 2 percent of the students participate" (p. 67). The literature has shown that there are many reasons why co-op student enrollment is 2% of the school's population and a few are listed here.

1. Many students find work experience while in college but choose not to use the cooperative education program. Thus, some of the work experience is career related and some is not.

2. At the college level, many students are taking classes on a part-time basis and are employed full time, leaving no time for a cooperative education position.

3. Students may choose from several options for financing college, and these options may include state, federal, and institutional aid packages (Sovilla, 1988). Many students choose to bypass co-op education entirely.

Student participation in cooperative education may depend on how well the college publicizes the program. *The Directory of College Cooperative Education Programs* lists colleges and universities with cooperative education programs, but every department within these institutions does not make co-op education training mandatory (required for graduation) (Hutcheson, 1996). If co-op education does not dominate the curricula, many students may feel it is not a worthwhile experience. The Congress of the US (1995) reported that about half of the engineering technology departments in two-

year colleges and two-thirds of the science technology departments offer co-op education programs or other work-based learning. Very few colleges make co-op education mandatory for all students. Most co-op education programs are voluntary or optional. A few colleges require all students, or all those in certain programs of study, to participate. Whether a co-op program is mandatory or optional may be a deciding factor in co-op outcome studies. Outcome studies conducted at the only mandatory two-year college co-op program, LaGuardia College, revealed that 66% of the graduates had completed additional education 3 to 7 years after graduation, and 53% of those had obtained bachelor's degrees (Weintraub, 1980). These numbers represent a high percentage when compared to other programs that are not mandatory. Four-year colleges where co-op is mandatory include Wilberforce University, Ohio; University of the Pacific School of Engineering, California; and Drexel University, Pennsylvania.

Course credit.

An example of information regarding course credit, written by Farrow (1980) for Dallas County Community College District's co-op policy, is listed below:

1. Course credit will be awarded at the rate of one credit hour for each 80 hours of work experience accomplished during the semester. The maximum credit is four hours credit for an approved 320 hours of work; minimum credit is three credit hours for an approved 240 hours of work during one semester.
2. The student may receive credit for a maximum of 20 hours of work per week for 4 credits or 15 hours of work per week for 3 credits. A full time employee may apply only these weekly maximums toward co-op credit.

3. The number of hours to be awarded for co-op should be agreed to at the beginning of the semester so reasonable learning objectives can be formulated to fit the number of hours to be worked.
4. Granting of credit is conditional upon:
    - Satisfactory accomplishment of the agreed to learning objectives as stated in the student/employer agreement.
    - Submission of all required forms on time
    - Attendance at 16 weekly seminars
5. The student may earn up to 16 hours credit toward a specified associate degree or certificate (This will vary according to the field of study) (p. 14).

The year placement begins.

Students may enroll in the co-op education experience beginning in the sophomore year through the senior year for four-year colleges and universities, and training can begin in the freshman year for some community colleges (Congress of the US, 1995, p. 66). Heinemann (1988) suggested that students be allowed to participate as early as possible, even during the freshman year at four-year colleges and universities, if the aim of the institution is to reduce attrition. Some institutions require students to enroll year round or to complete an extra year of schooling before graduation, and others limit the cooperative education credit that can be used toward graduation.

Length of cooperative education work period.

Co-op education programs work periods within the NC Community College system varied in length from 1 quarter (11 weeks) to 3 months (Hutcheson, 1996). The

numbers of work periods varied from a minimum of 1 work period to a maximum of 7 quarters (Appendix 1). Community college administrators realized that adding additional semesters for cooperative education would not work because most students are under financial pressure to graduate as quickly as possible. Nevertheless, once the NCCCS converted to the semester plan, it took students longer to complete than regular programs (North Carolina Community College System, 1997-98, p. 11). Some four-year institutions have adopted the policy of extending their programs to accommodate co-op education. "Eighty percent of community colleges report that cooperative education does not delay graduation as compared to senior colleges where graduation is delayed at 52 percent of the institutions" (Heinemann, 1988, p. 59).

Student evaluation.

The evaluation process like other processes of the co-op program involves all three components of the three-way partnership triangle (Figures 1.2 and 2.1). Students may give a written and oral evaluation of his or her own experience as far as learning and other developmental outcomes to his or her co-op supervisor. Both students and co-op supervisors benefit from the evaluations. Performing well on the co-op job is only part of obtaining academic credit. Students are given the opportunity to express their opinions in writing because this reinforces that sufficient writing skills are needed for job advancement. Maintaining a journal is another method students can use to document the co-op experience. Even after journals and essays of the co-op experience have been submitted, follow-up discussions of the experience between the student and co-op supervisors can be both an educational as well as an evaluative process. The educational

and evaluative process of co-op education can help the students gain knowledge about themselves: self-understanding, self-direction, and self-confidence. An increase in these personal qualities helps students "manage their own education and career development during and after college" (Dawson, 1989, p. 11).

The co-op coordinator uses the work performance evaluation form completed by the employer to assess how to award academic credit. The academic credit awarded for the co-op experience represents a grade for the work performance but, more important, represents a measure of enhanced learning. "Enhancement of education takes into account the skills that have been acquired and strengthened, the new insights and understanding that have been gained and the personal effectiveness in communications that have been affected" (Dawson, 1989, p. 10).

As depicted in the conceptual framework (Figure 1.2), teaching occurs both in the workplace and classroom. Therefore, to a certain degree, the employer is responsible for educating the student. Work supervisors and associates also contribute greatly to the student's education. Although the co-op employer makes some judgment about the student's work performance, an evaluation also includes comments concerning the student's approach to the job; their manner of making decisions, accepting suggestions, and criticism; and their adjustment to the job.

The majority of community colleges offering co-op education use a variety of methods to evaluate student performance. The vast majority of institutions use employer evaluations and for some it is necessary to document achievement of agreed-upon learning objectives (Heinemann, 1988). Antioch College in Ohio requires students to

write co-op education reports (essays) at the end of each work period (Dawson, 1989). If the students are involved with course-related or job-related research projects, the project may be the focus of the report. Students include job descriptions and reveal how the job influenced their academic development, insights, skill development, knowledge, and career orientation. Students also evaluate the job and the work supervision and offer suggestions about how the college might improve its partnership with the employers. Dawson (1989) reported that student interviews, journals, and any type of documentation of the co-op experience the students wrote "proved to be a key element in improving the functioning of the co-op program" (p. 8). Documentation of the co-op experience serves as a picture of the experience and can be used for counseling students to help them to grow in respect to their career goals.

Dawson (1989) proposed the following set of questions to help students to evaluate their work experience:

1. How does the experience on the job relate to the expectations you had in arranging the placement?
2. What are the important sources of learning in this experience—the job itself, the job environment, other sources?
3. What kinds of skill development does this experience offer—in work performance, in communication, in interpersonal relations?
4. In what ways does your job relate to any of your past and current academic studies? Does it suggest the need for certain future studies?

5. What contribution does your co-op living and work experience make to your understanding of the occupational world?
6. What kinds of technical and/or general knowledge are you gaining from this experience?
7. How has this co-op period affected your educational and career goals? Your future plans for studies and experience? (p. 9)

Although the purpose of the site visit is to monitor the student's progress, these questions may also be used for discussions during the college official's visits. Designing questions for co-op students adds structure to the co-op experience and stimulates the student's observation beyond the normal vision of the job.

Minimum competencies.

Community college officials establish legitimate grounds for suggesting that co-op more so than non co-op students/graduates see a connection between school and work because the work experience is closely integrated to the classroom experience through minimum competencies that should be obtained. Minimum competencies, also referred to as "job performance objectives," are drawn up in consultation with business partners and students (Charner, 1996; Heinemann, 1988). To enhance credibility and ensure program effectiveness, some co-op practitioners require students to sign learning contracts that include comprehensive sets of minimum competencies (Charner, 1996; Dallas County Community College District, 1983). The student-centered minimum competencies are based on learning objectives and include program requirements, reading lists, or a final paper requirement (Dallas County Community College District, 1983). According to

Heinemann (1988), some co-op students may be asked to document that they achieved the competencies. In addition, some college establish seminars that students must attend before, during, or after their co-op experience (Heinemann, 1988).

Co-op Education Employer

Employers are a critical part of the co-op education program and without them the programs could not be realized. The interrelationship between the employer and the institution depicted by the conceptual framework (Figure 1.2) suggests that an overlap of information may exist within this study. Co-op employers and community college faculty agree on the benefits of co-op education, as Villeneuve and Grubb (1996) reported. In 1993, Villeneuve and Grubb interviewed 66 representatives of 54 area firms and 25 individuals from 7 community colleges to determine the perceived benefits of the co-op programs offered by two-year colleges in Cincinnati, Ohio. One comment was that "students gained motivation through seeing the relevance of education to work and were therefore more likely to stay in school" (Villeneuve & Grubb, 1996, p. 47). Some researchers feel that students benefit most from co-op if they experience the workplace and then return to school. "Students seem to appreciate their programs more when they go back into the classroom, they understand things more" (Villeneuve & Grubb, 1996, p. 48). Although the employers and co-op faculty work to make the co-op education experience focused on the students' needs, they work to present benefits for all partners in the three-way partnership. The information presented includes the role played by the employer to assist the faculty and students who participate in the co-op program.

Employers provide jobs for students and incorporate learning that draws on classroom theory. For some co-op graduates, the co-op experience leads to professional employment. The employer benefits because co-op assists in recruiting present and future employees (Figure 2.2). The employer also benefits because co-op reduces the training period and requirements for students who continue as employees (Figure 2.2). Wilson (1988) reported that, nationally, 4 out of 10 of all graduates of co-op return to work for a former employer (p. 83). This statistic suggests that employers as well as students find the partnership to be favorable. Faculty benefit from the partnership with co-op employers because the employers serve as mentors, provide summer employment, supply equipment, advise on equipment purchasing, visit classrooms, and offer site visits for teachers (Hoerner & Wehrley, 1995).

Co-op education employers in business and industry play a large role in promoting learning in the workplace, but they can also contribute to teaching work-based learning in the classroom. As previously mentioned, schools often have difficulty affording state-of-the-art equipment, and, because of rapid technological changes, students do not always have the opportunity to learn the techniques being used in the workplace. By providing needed equipment and supplies, business and industry contribute to colleges and universities and help teachers stay current.

If institutions are interested in purchasing their own equipment, business can be both a source of advice on which equipment is most often used and a source of support for obtaining equipment. When companies purchase new equipment, educators hope they will donate state-of-the-art equipment to institutions rather than hand-me-downs that do

not function. In addition to donating equipment and supplies, employers can also serve as guest speakers for classes, mentors for instructors, and provide summer employment for instructors.

Researchers have confirmed that most employers participate in co-op because they seek cost-effective human resources and after-graduation talent, but there are several other benefits for co-op employers (Wilson, 1988, p. 83). Companies participating in the co-op education program benefit in the following ways:

1. The cost of training co-op students is much less than that of comparable training given to graduates who have not had the benefit of the co-op education experience.

2. An impressive percentage of co-op students have accepted permanent employment with their co-op employer upon graduation. Congress of the US (1995) reported that "an estimated 40 percent of college co-op graduates take jobs with their former employers," which indicates employer satisfaction with the co-op student (p. 68).

3. The company is able to contact and screen prospective employees from a select group of students early in their educational careers. This reduces recruiting costs.

4. Through continuous rotation of co-op students, one full-time position can be filled annually by alternating with two students.

5. Students returning to the campus after their work period will be instrumental in acquainting other students with the company.

6. The co-op education program helps employers obtain a pool of potential employees from which they can draw to fill vacancies as they occur.

7. The employer can use "co-op trainees" to fill assignments that fall between those too difficult for the high school graduate and those that normally do not require the abilities and talents of professionals. By using co-op trainees, the employer can more effectively use its highly paid personnel for more specialized work.

8. Industry becomes a partner in the total educational program (Tillton Square Community College, n.d., p. 3).

Work-Based Learning

The conceptual framework of co-op education (Figure 1.2) depicts work-based learning as being linked to classroom learning through teaching. Hickey (1995) defined work-based learning as being contextual, real-world learning through workplace experience, including structured training and mentoring at the job site. According to Ricks and colleagues (1990), when learning occurs in real environments, such as workplaces, learning is stimulated and the learner is engaged in a vital and active way. Leslie (1996) agreed that the best way to achieve learning is to fully involve the learner in discovery through work, co-op internships, and other forms of jobs.

However, technically speaking, studying about work, learning how to work, or simulating a workplace in school are all examples of school-based learning, not work-based (Hamilton & Hamilton, 1997a). Furthermore, simply placing students in a work setting and hoping they will learn general workplace competencies, industry-specific interests, positive work attitudes, and interactive skills do not constitute work-based learning (Hamilton & Hamilton, 1997; Hickey, 1995). A work setting without learning

that has been nurtured, a curriculum design that is applied, or that does not use several techniques for delivering learning, does not provide work-based learning (Leslie, 1996).

Although work-based learning includes format/model variability, Branton and associates (1990) formulated three main characteristics of co-op education programs as a basis for hypothesizing that co-op education programs as opposed to non co-op programs are successful in implementing the principles of learning. Their hypotheses (Branton et al., 1990) have been supported by other researchers (Brown, 1984; Gardner & Rostowski, 1993; Stern et al., 1992).

Program Characteristic: The work experience relates to and integrates with the academic experience (Table 1.1). Hypothesis: *Co-op students whose work terms are related to and integrated with the academic experience should retain more information from their work and course experiences, and be able to apply the information more effectively than non co-op students* (emphasis mine) (Branton et al., 1990).

Being able to apply information learned in the classroom is important in today's workplace. The "new workforce" must face a high performance workplace that requires an educated person who can perform many specific tasks and accomplish them using excellent judgment (Hickey, 1995, p. 2). Co-op education practitioners make claims that co-op graduates are better prepared for the workplace and data substantiates the claim. Research conducted at Northeastern University's Cooperative Education Research Center showed that co-op graduates have more realistic expectations regarding the first job after college than do graduates of non co-op degree programs (Brown, 1984). The data suggest that co-op bridges the gap between school and work, with the potential to enhance the

graduates' sense of power on the job. "Those studies have repeatedly found that participation in college level cooperative education is associated with the establishment of more realistic career goals, higher academic achievement, increased self confidence, more 'savvy' about the world of work, and better job-seeking skills" (Congress of the US, 1995, p. 68). Gardner and Koslowski (1993) used participants from two different institutions, and their findings suggested that the co-op experience better prepares the graduate to assume the role of a responsible employee in a new organization more quickly than non co-op graduates. Non co-op participants were recruited from a pool of graduating seniors from engineering and business at a major research university, and co-op participants were recruited from the respective groups but from a four-year co-op institution. The co-op graduates reported experiencing greater knowledge and adjustment in the new job (Gardner & Koslowski, 1993).

During a longitudinal study, Stern and colleagues (1992) examined a sample of students from two-year colleges to determine co-op and non co-op students' perceptions of their jobs and how those jobs related to their studies. The data, collected in the fall of 1989, was considered post-secondary baseline data. Four institutions were selected for the survey, one two-year public technical institute in a Midwestern city and the other three were public community colleges on the west coast. The results showed that significantly larger numbers of co-ops reported that "their jobs are related to their careers, are interesting, provide opportunities to learn, and positively reinforce their efforts in college" (Stern et al., 1992, p. 45). "Given the greater mutual reinforcement between school and work among co-ops compared to non-co-ops, one would expect that

more of the co-ops will achieve their educational objectives" (Stern et al., 1992, p. 46). "Because of that, and because their present jobs are already more closely related to their desired careers, one would also expect greater occupational success for the co-ops (Stern et al., 1992, p. 46). Stern and colleagues (1992) planned to test this prediction when the follow-up data from this survey became available.

Pumphrey and Wessels' (1995) report to the North Carolina Community College System further supported Branton's hypothesis that co-op students do better in course work. Pumphrey and Wessels (1995) reported that the cumulative GPAs of the co-op students suggested that co-op education had a very positive effect on academic achievement. "Students in cooperative education programs received higher grades, were more likely to graduate, and completed more course work than non co-op, which were all statistically significant" (p. 39). In addition, Hamilton and Hamilton (1997b) stated that co-op students achieve high academic standards.

Somers (1986) examined Gordon College, a Christian liberal arts college in Massachusetts, and could not say conclusively that co-op caused higher graduation, but these studies suggested a strong relationship. Co-op was not introduced to improve retention, but the study suggested it did. Somers found that 75% of co-op students completed degrees, whereas 65% of non co-op students completed degrees.

Gardner and Motschenbacher (1993) examined the early work experience of Michigan State University engineering graduates of 1979-1990, who the authors noted were not representative of other co-op education program graduates because they were drawn from the automotive industry. Results showed that the co-op experience appeared

to have little effect on career progress (promotion) in comparison with other work experiences. Similarly, the co-op experience of graduates who became employed by their co-op employer had fewer advancements than those who were employed by other agencies (Pumphrey & Wessels, 1995).

Program Characteristic: Work experiences are productive. Hypothesis: *Co-op students may have greater confidence, may perceive themselves to be more capable and should be better motivated than non co-op students, possess better deductive and inductive reasoning skills than non co-op, possess increased certainty in careers than non co-op, and are more independent than non co-op students* (emphasis mine) (Branton et al., 1990).

The Congress of the US (1995) reported that their evaluation of past work-based programs indicated that many students are excited and motivated by work-based learning (p. 4). Demonstrating greater confidence and showing themselves to be more capable than non co-op students, co-op students have been encouraged to direct their own co-op learning experience. Self-directed learning is demonstrated because students, with encouragement from coordinators, find their own work arrangements, and later, after finding a position, negotiate the particulars of the work contract with the college. The ever evolving, high performance workplace requires self-directed workers who can "adapt to, produce and even define "these changes (Hickey, 1995, p. 2).

Coordinators ask students to give input when compiling lists of job performance objectives to be achieved through their co-op position (Charner, 1996; Ricks, 1996). Students must also document, through interviews, focus groups, or written evaluations,

that these objectives have been achieved (Ricks et al., 1996). The co-op official can also document completion of job performance objectives through program evaluations, follow-up studies, or by analysis of student's progress through the program.

A productive co-op experience means that students actually produce goods and services, and so they are not just observers. Hickey (1995) commented that more learning will probably occur in the workplace than in the college or university. The co-op experience is not intended to be an experience in which students perform repetitive tasks without learning any other skills. Through the co-op experience, students gain basic and high technical competence because the work is challenging and they are exposed to many aspects of the industry through rotation and projects (Hamilton & Hamilton, 1997b). To ensure students receive breadth of experience, most agencies use rotation, a systematic move through several different placements. This technique of job training exposes the student to different units, helping him or her to understand how all units contribute to the entire organization's functioning (Hamilton & Hamilton, 1997b). Today's world demands knowledge of rapid technological advancements and speedy delivery of goods and service. Both factors are causing demographic shifts, international competition, and flattening of hierarchy (Hickey, 1995). Students realize the rapid changes occurring in the workplace by completing projects and rotating in different areas during the co-op education experience.

Hamilton and Hamilton (1997b) contended that work-based learning like co-op education enables students to learn how to "perform work tasks" but also helps them to "acquire a firm foundation of knowledge and skills, appreciation for expertise,

confidence in their own ability, and understanding that learning continues for a lifetime" (p. 683).

Program Characteristic: Work experiences are supervised by personnel from the educational institution and by knowledgeable individuals from the workplace. Hypothesis: *Co-op students should receive feedback which is relevant to their learning situation more frequently than non co-op students* (emphasis mine) (Branton et al., 1990).

Hamilton and Hamilton (1997b) stated that the co-op education experience is structured so that supervisors and mentors have formally assigned teaching roles and students learn from role models who are coordinators, managers, coaches, and mentors. By working with and observing role models and mentors, students learn how to learn, acquire a foundation of knowledge, develop not only technical skills but an appreciation for expertise, confidence in their own ability, a capacity for analytical judgment, and the understanding that learning continues for a lifetime (Hamilton & Hamilton, 1997b). Mentoring during the co-op experience helps the student identify and follow a career path, which helps the student develop not only technical skills but interpersonal skills and confidence.

Smith-Eggeman and Scott (1994) conducted a study at the University of Northern Colorado in which co-op and non co-op undergraduate students were compared to determine the development of interpersonal skills. The co-op education students more so than the non co-op students demonstrated enhanced tolerance and a respect for people of different cultural groups, their values, and their lifestyles (Smith-Eggeman & Scott, 1994).

Pedro (1985) examined the characteristics of experiential education by testing females and demonstrated that experiential education improved self-confidence. The participants completed a battery of instruments (pre-tests and post-tests) in a study conducted at the University of Wisconsin. Results revealed that experiential education, such as co-op education, caused participants to (a) value social recognition, ambition, and being capable; (b) describe themselves as leaders; and (c) see their ideal job as providing for activity and recognition (Pedro, 1985).

Teaching

Teaching as defined here means to instruct by example, by experience, or by general rules of actions or principles. Teaching is the sharing of knowledge, a "reciprocal, interdependent relationship," between student and teacher that takes place in classroom learning at the community college and in work-based learning through off-site supervisors (Baker, Roueche, & Gillet-Karam, 1990, p. 3). Teaching as it relates to co-op education means instructing students so that knowledge gained in the classroom can be integrated with knowledge gained in the workplace. Co-op students have a greater opportunity than do non co-op students to understand the connection between school and work because of many factors, including the teaching that takes place both in the classroom and the workplace (Inger, 1995; Stern et al., 1992).

Hamilton and Hamilton (1997b) labeled four critical teaching roles at the workplace: coordinator, manager, coach, and mentor. Individuals who function in any of these teaching roles help to determine the quality of work-based learning found in the workplace. The coordinator "designs a plan for a career path with goals and objectives

for learning." He or she "recruits, orients, and supports adult participants." He or she "oversees rotation schedules in departments and reviews the learning progress." The manager "supervises learning in the department." He or she "decides what students will learn in a department, which work tasks will enhance learning, and in what order." He or she also "reviews learning and organizes assessment." The coach "demonstrates how to do a task while [the] co-op student watches." He or she "points out important features and questions understanding." He or she "models problem solving." He or she is "responsible for teaching students to perform routine tasks and for fostering their understanding of what they are doing and why." He or she gives "feedback about the student's performance." The mentor "initiates [the] co-op student into the workplace culture. When they engage in work-based learning, co-op students enter a new culture with its own rules, conversions, and norms." The mentor "advises students on career directions, helps to solve problems with the manager, the school, the family members, or peers" (pp. 686-687).

To integrate, connect, and blend school-based and work-based learning, classroom teachers must have both content-based and work-based knowledge (Hoerner & Wehrley, 1995). In a world where change dominates our lives, work-based knowledge has taken priority over content-based knowledge. Convincing educators to adopt the work-based philosophy in teaching is a slow process (Hoerner & Wehrley, 1995). Because work-based learning is still in its infancy, data are not conclusive that work-based learning will solve the problems in education. Although work-based learning makes intuitive sense, "the initial phase of paradigm shift requires acting on faith before

proof is available" (Hoerner & Wehrley, 1995, p. 103). The present study may provide proof that work-based learning is needed. The proof lies in work-based programs like co-op education. Documenting accountability and promoting the programs using outcome studies are the directions in which educators should move (Hutcheson, 1995). With increasing fiscal constraints, educators are more concerned than ever about program support and survival, making the need for outcome studies more prominent. Hutcheson (1995) further added that local, state, and national policymakers demand assessments of the effectiveness for programs they support. The present study may present an assessment of cooperation education's effectiveness.

Co-op students as well as non co-op students have been shown to benefit by attending a school that offers co-op education. Pumphrey and Wessels (1995) demonstrated the "institutional effect" of co-op education, first publicized by Loken and Cutt. Loken and Cutt (as cited in Wessels & Pumphrey, 1995, 1996) suggested that the institutional effect explained the positive effect of co-op education on all students within a college offering co-op. Pumphrey and Wessels (1995) reasoned that because the faculty demonstrated a familiarity with the business world and the business world had a better knowledge of the college, both were able to influence both co-op and non co-op students through classroom teaching techniques.

The question might be asked about the status of classroom teachers' work-based knowledge. According to Hoerner and Wehrley (1995), the majority of educators have not had substantial employment experience outside of education. As a result, they are

unfamiliar with their students' employment setting. A variety of methods can be used to help instructors maintain knowledge and facilitate growth.

Summer employment for classroom teachers (Table 1.1) is one way to provide information about how the subject matter is applied in the work world (Hoerner & Wehrley, 1995). Work site visits (Table 1.1) can also be arranged for instructors, which can include a one-time experience or periodic visits of the facility. Classroom teachers can gain a new outlook on teaching by spending a couple of weeks in the summer visiting a number of companies, while at the same time gaining valuable information for curriculum development. When technical assistance is needed, classroom teachers can also seek the employer's help who is glad to answer questions concerning the implementation of applied curricula. Classroom teachers can also initiate mentorship activities (Table 1.1) with employers to promote work-based learning in the classroom. Some colleges and universities have found benefits in devising innovative plans with employers to strengthen the teaching process by allowing a classroom teacher to change places with an employee in the workplace. The employee becomes responsible for the teaching assignments, gains knowledge of classroom activities, and makes a contribution to enhancing the curriculum (Heinemann, 1988).

Field trips can be used as a teaching technique to help students make the link between classroom learning and work-based learning. Students find that field trips are not only interesting but also help them in making career choices (Hoerner & Wehrley, 1995). Charner (1996) suggested that new teaching techniques such as the apprenticeship approach of modeling, supporting, and turning over task/projects to students are

imperative to prepare students for today's workplace (Table 1.1). Classroom teachers should also build on what students already know, encourage collaboration among students, and develop ways to evaluate and document learning of complex tasks (Charner, 1996).

If teaching integrates school-based and work-based knowledge then learning transfer is enhanced (Figure 1.2). Learning transfer is critical if students are to transition from school to work. Teaching that takes place in the classroom and in the workplace enhances the transfer of learning by providing practice, reinforcement, and building self-esteem among other things.

According to Branton and colleagues (1990), the learning transfer is enhanced by co-op education because the program design is based on the Ten Principles of Learning first established by Foster (1986). A few of the Ten Principles of Learning are most applicable here.

1. *"The Principle of Practice: We learn to do by doing, by instruction in and by images of doing and through observation"* (emphasis mine) (Branton et al., 1990, p. 34). Teachers enhance the transfer of learning because their teaching strategies are contextual and allow opportunities for students to practice skills in their chosen academic fields (Mitchell, 1977). Classroom teachers provide activities and discussions that focus on issues in the workplace (Charner, 1996).

2. *"The Principle of Reinforcement: Reinforcement is important in the mediation of learning but only to the extent that it is relevant to the individual and to the situation"* (emphasis mine) (Branton et al., 1990, p. 34). Classroom teachers present the theoretical

basis for knowledge and skills needed in the workplace (Hoerner & Wehrley, 1995). The workplace knowledge and skills subsequently reinforce classroom learning.

3. *"The Principle of Self-Efficacy: What a person learns depends upon the person's perceptual organization of the situation and upon the person's perception of self"* (emphasis mine) (Branton et al., 1990, p. 34). The work-site teacher helps the student improve self-esteem and confidence and therefore learning is enhanced (Hamilton & Hamilton, 1997b).

4. *"The Principle of Transfer: Transfer of learning increases with task similarity and the degree to which new learning may be 'anchored' in existing cognitive structures"* (emphasis mine) (Branton et al., 1990, p. 34). Classroom teachers set up practice laboratories for students that present tasks similar to those conducted in the workplace (Charner, 1996). The work-site teacher assists the student in performing similar activities, such that the co-op student's new learning is "anchored" in existing cognitive structures (Hoerner & Wehrley, 1995).

5. *"The Principle of Retention of What is Learned: The key factors in retention are practice and meaningfulness"* (emphasis mine) (Branton et al., 1990, p. 34). Classroom teachers encourage students to practice job-related exercises in the classroom. The work-site teacher assists the student in performing the same exercises in the work place, making learning more meaningful (Branton et al., 1990).

Professionally Employed Graduate

Co-op education practitioners and educators claim that co-op training prepares graduates for the workplace (Congress of the US, 1995; Hamilton & Hamilton, 1997;

National Commission for Cooperative Education, 1994; Ricks, 1996). But the workplace has undergone and continues to undergo restructuring and changes that are affecting many areas of our lives (Gardner & Tyson, 1994). Unless Americans develop a commitment to comprehensive lifelong learning, our nation will unable to sustain its leadership position in the global economy (*Report of the Commission for a Nation of Lifelong Learners,* 1998). Because increasing numbers of college graduates are now working in positions that do not require college degrees, the question of whether the community college co-op graduate has been able to secure the high-skill, high-wage job is an important one (Gardner & Tyson, 1994). If co-op graduates are transitioning into the high-skill, high-wage jobs, does co-op education motivate graduates to pursue additional education and to achieve salary gains? The question might also be asked, if employers who spend a lot of money on employee training motivate employees to pursue additional education, and is this training required for salary increases? If co-op programs are going to be held accountable, co-op researchers' claims about the salary advantage for co-op graduates need to be substantiated with outcome studies (Hutcheson, 1995). A number of co-op education outcome studies have been conducted using four-year colleges and universities, but few have been conducted using the community college (Boesel et. al., 1994). Thus, a need exists to examine community college co-op graduates' pursuit of additional education and achievement of salary gains.

Co-op Graduates Are Prepared for the Workplace

As depicted in the conceptual framework (Figure 1.2), graduates who have participated in the co-op education program are prepared for the workplace through

"contextual" classroom learning at the community college and work-based learning at the co-op employer's site (Mitchell, 1977). Branton and colleagues (1990) suggested that, because of the program's characteristics and the support activities (Table 1.1), co-op students more so than non co-op students see a closer connection between school and work and are better able to follow a career path. The work of Branton and colleagues (1990) is supported by Boesel and associates (1994), Charner (1996), Congress of the US (1995), Heller and Heinemann (1987), Hutcheson (1996), Inger (1995), Michigan State Department of Education (1995), National Commission for Cooperative Education (1994a), and Ricks (1996).

According to Branton and associates (1990), integrating school and work through co-op education should result in co-op students, more so than non co-op students, performing better in solving problems and applying knowledge to practice in the work world. Pumphrey and Wessels (1995) demonstrated that co-op graduates are also more likely to report they are using the skills they learned in college. Because of their increased ability to solve problems and apply knowledge, co-op students realize higher academic achievement than non co-op students, a trend that tends to persist until graduation (Congress of the US, 1995; Hamilton & Hamilton, 1997b; Pumphrey & Wessels, 1995; Wilson, 1988).

Researchers have demonstrated that co-op students possess more motivation and confidence and higher self-esteem than do non co-op students (Congress of the US, 1995; Wilson, 1988). As previously mentioned, co-op graduates develop increased "savvy" about work and also have more realistic career expectations (Wilson, 1988). Branton and

colleagues (1990) proposed that motivation, confidence, and a positive self-image make a good foundation for individuals when applying knowledge. Therefore, co-op students/graduates should perform well on tasks that require deductive and inductive reasoning processes, a sign of high learning (Branton et al., 1990).

Co-op graduates who are confident and motivated are likely to demonstrate these qualities in personal and workplace behaviors. For example, individuals with co-op experience have definite career goals and demonstrate more independence (Branton et al., 1990; Congress of the US, 1995). Research conducted by Pumphrey and Wessels (1995) suggest that co-op graduates report more job advancements than do non co-op graduates. Hamilton and Hamilton (1997b) concurred with Branton and colleagues (1990), suggesting that, when compared to non co-op graduates, co-op graduates identify and follow a career path that traces a lifelong occupational journey involving both additional education and employment.

To demonstrate the long-term job commitment that co-op graduates possess, Foster, Franz, and Waller (1986) conducted a study at Central Missouri State University, College of Business and Economics. The researchers mailed questionnaires to the 1981-1984 graduates. Co-op graduates were satisfied with their jobs even if they desired a change in the location, whereas graduates without the co-op experience were satisfied with their jobs only if they were also satisfied with their geographical location. For those who had a co-op experience, location did not play a significant role in their liking/disliking of jobs. The researchers demonstrated a statistically significant difference

between the groups and concluded that, by hiring co-op graduates, the employer may maximize employee retention.

Co-op students are better prepared for the ever changing workplace because their work experience has been monitored and supervised by people from the college or university and the work site (Branton et al., 1990). Supervision of the work experience has afforded co-op students the opportunity to interact with different role models (mentors, teachers, coaches, and managers) to gain exposure to different learning situations and styles and to receive relevant feedback (Branton et al, 1990). With these experiences, co-op graduates more so than non co-op graduates should realize the importance for good communication and interpersonal skills. According to Hamilton and Hamilton (1997b), employers frequently say that technical skills are not what they value most in entry-level employees, rather social competence, such as punctuality, reliability, and diligence. "People who have demonstrated personal and social competence can be trained in technical skills." "Personal competence encompasses self-confidence, initiative, motivation, commitment to continuous improvement, and career planning." "Social competence includes learning about organizational systems—the purposes of an organization its structure, how one department connects to another, the roles of people in the organization, obligations to clients and customers and how the firm operates (Hamilton & Hamilton, 1997b, p. 685).

Graduates Currently Pursuing Education or Intending to Pursue Education

Community colleges have conducted follow-up studies of graduates and have questioned graduates on not only whether they have completed additional education but

also whether they are pursuing education or intend to pursue additional education. Community colleges should be the gateway to four-year colleges. Therefore, community college leaders need to know what portion of community college graduates are pursuing bachelors' degrees. Also, if one function of community colleges is to help their graduates acquire additional skills, then community college leaders need to find out how many community college graduates are returning to community colleges for further education. The present study was designed to gather information on whether community college graduates had completed, were pursuing, or intended to pursue additional education.

Conklin (1992a) presented data to show that, out of 480 completed surveys from graduates of Johnson County Community College in Kansas, 20.2% planned to transfer to a four-year institution, 24.2% planned to improve skills for their present job, and 56.3% planned to enroll in classes. Another study that relates closely to the present study, because it examined the intentions of two-year college students, compared co-op and non co-op students, not graduates. Heller and Heinemann (1987) examined two-year and four-year co-op college students, used mail surveys, and questioned the students concerning their intentions to pursue additional education. A significant number of students in both groups planned to continue their education beyond the baccalaureate level. However, the co-op group generally had higher educational aspirations. Heller and Heinemann (1987) contended that students whose work is part of their education, unlike their working peers whose work is unrelated to schooling, are somewhat more likely to want additional education.

A review of the literature reveals that knowledge of the number of graduates pursuing additional education at the time the survey is administered is valuable information. On the basis of surveys that included this question, the researcher in this present study obtained an indication of predicted outcomes. Conklin (1992a, 1992b) surveyed Johnson County Community College's 1987-1988 and 1991 graduating classes, respectively. The percentages of graduates pursuing additional education at the time of the survey were 30.6% and 33%, respectively. Johnson County Community College (1990) surveyed its 1988-1989 graduates and reported 21.6% of its graduates were pursuing additional education.

Education Completed

Scheetz and Gardner (1989), reporting for Michigan State University, presented data showing the extent to which college graduates for the year 1987-1988 at all levels in the State of Michigan had pursued or were pursuing additional education. Research findings show that those with associates' degrees pursued additional education to a greater extent than those with higher levels of education. Pursuit of additional education for college graduates varied from a high of 22% for those with an associate's degree to a low of 7% for Ph.D. recipients.

The present study and Wessels and Pumphrey (1993, 1995) are much like the follow-up study conducted by the Illinois Community College System. The Illinois Community College System, like the North Carolina Community College System, has taken a leadership role in workforce preparation. Since 1974, the Illinois Community College System has periodically conducted statewide studies of occupational graduates to

monitor various components of career development, including current educational status (Illinois Community College Board, 1991). For the academic year 1987-1988, 29.1% of the graduates were continuing their studies, which was much like the figure for 1996, 28.8% (Illinois Community College Board, 1991, 1996).

Pursuing additional education is important, but what is most impressive and useful for the graduate is to complete the training being sought. Among the community college follow-up studies with similar characteristics reviewed here, Conklin (1992a) reported the highest percentage of graduates having completed additional education. Conklin (1992a) reported for Johnson County Community College System of Kansas that 40.7% of the 1987-1988 graduates had earned degrees or certificates during the 4 years since they had graduated from college. Of those having earned credentials, 52% had earned a bachelor's degree. North Carolina Community College System graduates, when surveyed in 1993, came close to the 40% completion rate of the Illinois Community College System. Pumphrey and Wessels (1995) in their report to the NCCCS presented data that showed 36.25% of the graduates had completed some form of additional education. By 1995, when the North Carolina graduates were surveyed again, 51.1% of the graduates had pursued additional education. John Tyler Community College in Virginia, which surveyed its 1980 class 5 years after graduation, showed a completion rate closer to the 1993 North Carolina survey. Twenty-nine percent of the graduates of John Tyler Community College had received additional education or training since leaving the school (Hollins & Smith, 1986).

Co-op Participants' Salary Advantage

The literature shows that, in some populations, co-op participants demonstrate a higher starting salary than do non co-op participants (Gardner & Motschenbacher, 1993). Yet, it has also been shown that the salary advantage does not persist for some populations of graduates (Wessels & Pumphrey, 1996). Demographics, GPA, and academic major have been shown to be factors in examining a salary advantage. In addition, Somers (1995) maintained that starting salaries are influenced by academic major, academic ability, the industries in the vicinity, region of the country, and labor market conditions.

Gender.

Gender has become an important issue in hiring and will become more of an issue in the 21st century. Workers are pressuring employers to address issues of diversity by hiring more minorities and women. The present study has also examined variables in relation to gender. Consequently, in studies where the salary advantage for the co-op participant has been demonstrated (Gardner et al., 1992; Wessels & Pumphrey, 1996), co-op education had a positive and significant impact on the salary of females that persisted through both the 1993 and 1995 studies. The impact of co-op education on the wages of males was insignificant (Pumphrey & Wessels, 1995). Wessels and Pumphrey (1996) suggested that the salary advantage for females exists for those who had little work experience prior to entering co-op. Gardner and colleagues (1992) suggested that, for females in the area of electrical, chemical, and mechanical engineering, co-op participation had a large effect on starting salaries. Females in co-op programs and in

certain academic areas are underrepresented. Hence, females with these qualities are highly valued or recruited for positions in engineering. Gardner and colleagues (1992) selected subjects from the 1979-1989 graduates of the College of Engineering at Michigan State University. Completed surveys were available for 370 co-op graduates from a potential pool of 800. A total of 1,037 non co-op graduates was surveyed. The co-op graduates demonstrated a salary advantage over the non co-op graduates.

Grade point average.

Employers have long been using the GPA to hire what they consider to be the "best and brightest," but the question of whether there is a correlation between GPA, co-op, and a salary advantage persists? Gardner and colleagues (1992) showed that grade point average was positively related to salary. For every .01 increase in GPA, starting salary increased by approximately $5.00. Co-op had a positive impact on salary, being significant at .03 (Gardner et al., 1992). The researchers used a wage model that regressed these variables on starting salaries: academic major, year of graduation, grade point average, sex, job location, number of co-ops, and same employer (co-op employer).

Academic Major

The academic major for which much research has been conducted in the area of co-op education is the engineering field (Grubb & Villeneuve, 1995). Co-op education was started by an engineering professor, thus many of the early programs were engineering programs and much of the early research and some of the recent research were conducted using engineers (Gardner & Motschenbacher, 1993; Gardner et al., 1992; Gillin et al., 1984; Rogers & Weston, 1987). The academic major is an important

consideration when using surveys to determine salary (Somers, 1995). Some academic majors, such as engineering, may afford graduates a considerably high salary. If the co-op participants are comprised of high numbers of engineers, the average salary of survey participants may be raised such that it may appear that a difference exists between the groups when there is none. In addition, the non co-op group may be comprised of large numbers of academic majors, such as liberal arts, that do not afford the graduate a high salary. Therefore, the non co-op group would appear to have a low salary. Thus, earning differences may be due, totally or in part, to the overrepresentation of a specific major in either group (Siedenberg, 1989).

The New Workplace and a Demand for Retraining

Technological changes within the last 10 years have been phenomenal (Gardner, 1996). Computerized technology has advanced to the extent that many companies are unable to incorporate changes. The increasing level of competition in our global economy creates more change in the high performance workplace (Hickey, 1995; Kotter, 1995). For the constantly changing workplace, continuous learning and an adequate foundation of skills and knowledge are required for long-term employability (Hickey, 1995). Although the mission of the North Carolina Community College System is to build the "workforce for the 21st century," fewer than half of today's workers have the skills, training and education to compete in tomorrow's workplace (NCCCS brochure, 1998). Hamilton and Hamilton (1997b) maintained that more and more, the statement holds true that to secure the job that pays well, one must be a well-educated person. However, the winning strategy for reshaping the workforce is to encourage workers not

only to obtain additional training but to anticipate and master the skills that will be required to compete in the 21st century (Risenberg, 1995).

Competing in the workplace in the 21st century means that workers must now face the harsh realities of the workplace. Changes and advancements in the workplace indicate that "the new workforce and workplace of tomorrow has already arrived" (Hickey, 1995, p. 2). Changes in economic and employment conditions, geographic constraints, organizational patterns, including social and cultural influences, have transformed the workplace into a high performance one. In addition to technological advancements, workers are also changing jobs more frequently in the new work place, increasing the need for retraining. Mosier's (1990) findings revealed that "a person entering the work force today will on the average, change jobs 7 times and occupations 3 times" (p. 1). Similarly, Risenberg (1995) suggested that success in this unpredictable workplace will require a willingness to change career goals in addition to obtaining additional education and training. Zdorkowski and Thomas (1984) contended that, in the face of workplace technological advancements, employees will need two or three retraining periods during their work lives, with retraining occurring every 10 years. The Commission for a Nation of Lifelong Learners reported that during the "next decade, 75% of the current workforce will need significant retraining (p. 23).

Employees are getting the message that additional education is needed. The Commission for a Nation of Lifelong Learners (1998) reported that more than 80% of adults recognize their responsibility to achieve more education and to advance their careers. Although most adults acknowledged the need for additional education, the rates

of participation varied widely. Adults with the highest education participated to a greater extent than those with the lowest education. Fifty percent of adults with master's degrees or higher participated in some form of adult and continuing education, compared to 35% of college graduates, 15% of high school graduates, and 5% of adults with the lowest educational levels (Commission for a Nation of Lifelong Learners, 1998). Vaughan and Berryman (1989) published research summaries that indicated employers show a tendency to invest training dollars only in their best-educated employers. Seventy-nine percent of college graduates receive training from their employers, as compared to 45% of high school dropouts (Vaughan & Berryman, 1989, abstract). Furthermore, workers who received training from their employers on one job were more likely to be trained on other jobs.

The need for worker retraining has been echoed by a number of sources, including proponents of co-op education who interpret updating skills as continuing to integrate work and learning throughout the career (Hutcheson, 1995). Kotter (1995) maintained that "lifetime learning is the new educational imperative" and that, if students are to succeed in obtaining jobs in the in the 21st century, their education must instill in them the will to keep learning throughout their lives (p. 27).

"Lifelong learning is not just a timely phrase, it is an imperative for a successful professional future" (Hutcheson, 1995, p. 77). In addition, integration of school and work is not just a strategy used by educational institutions but one that engages the employers as well. Employers have long supported training efforts through on-site or off-site

systems (Hoerner & Wehrley, 1995; Hutcheson, 1995; Vaughan & Berryman, 1989; Zdorkowski & Thomas, 1984). Hoerner and Wehrley (1995) stated:

> We are a work-oriented society and believe in lifelong learning. You are expected to get further preparation to be employable through graduate work, employment by a business or industry that will provide education and training to be productive, or to go to a community college to learn employable skills. (p. 6)

Preparing all students for further learning, citizenship, and productive employment should be the mission of all educational institutions. The time has come for institutions to make themselves accountable in accomplishing this mission (Hoerner & Wehrley, 1995).

Need for More Research

The majority of co-op program evaluations and research studies have been conducted on four-year colleges (Boesel et al., 1994). In the past, community colleges have not been considered research-conducting institutions, which is another reason for the lack of community college co-op education program research. Heller (1989) reported that, "although today approximately 4 out of every 10 institutions in the US with co-op are two-year, junior or community college, less than one out of 10 *Journal of Cooperative Education* articles are people affiliated with these colleges" (p. 49). A comparison of the contributors to the *Journal of Cooperative Education* indicates that 61% of the contributors are within the university system, and only 2% are within the two-year college system.

Even though co-op education began at the turn of the century, community colleges are relative newcomers to the field, with many programs springing up during the 1960s and 1970s. Programs flourished during these two decades, and most of the research in this area was published at that time (Hutcheson, 1995). Federal funding was plentiful, and technical assistance was supplied by the National Commission for Cooperative Education. Co-op programs have not greatly expanded since the 1960s and 1970s (Ricks et al., 1993).

The need for more community college co-op programs has been expressed. Way (1990) concluded that, because there are currently 1,200 community colleges with enrollments exceeding 5.3 million, community college educators have not fully taken advantage of all the benefits that co-op can offer. Similarly, Heinemann (1988) suggested that co-op education for community colleges could be a powerful education strategy, but its potential has not been fully realized. "Co-op education remains relatively unknown and a very underutilized strategy" (Heinemann, 1988, p. 60). A study conducted by Cumberland County College, a two-year college in Vineland, NJ, demonstrated a severe underutilization of co-op (Stolar, 1996). The reasons for low participation were not clear. Within a 4-year period, only 55 students registered for co-op. Stolar (1996) suspected that advisement to promote co-op may have been the problem. In contrast to the Stolar's (1996) findings, research from the Cincinnati Community College System indicated that co-op participation was high (Grubb & Villeneuve, 1995). All students matriculating toward a degree within the Cincinnati Community College System experienced the alternating format, which placed 300 different students in co-op yearly with 250

employers. Three hundred students represented about 35% of the total day enrollment of about 850.

Co-op proponents have claimed that co-op education participation promotes lifelong learning and opportunities for further education through the process of integrating school and work (Hutcheson, 1996; National Commission for Cooperative Education, 1994). "Evaluations of co-op programs in high schools and two-year colleges have been too sparse and too limited to permit any firm conclusions or generalizations" about additional education or employment (Boesel et al., 1994, p. 144). *The National Assessment of Vocational Education Final Report to Congress* (1994) indicated that only four-year institutions were examined for the majority of post-secondary co-op program evaluations. Consequently, there are very little data to substantiate claims concerning the pursuit of additional education by community college co-op graduates and employment. In addition to acknowledging a need for more community college co-op programs and related research, noted authorities in the field have suggested that research be theory based (Boesel et al., 1994; Inger, 1995; Loken et al., 1996; Ricks, et al., 1990; Wilson, 1988).

Thus, there is a call for more investigative studies with outcome data that can aid in substantiating claims of advantages to stakeholders. Wilson (1988) supported the call for more co-op research and added that the need for theory-based research is as important as the need for research. Ricks and colleagues (1990) concurred with Wilson (1988) that there is a need for additional research for planning, decision making, and for the modification of existing practices. Moreover, information generated from outcome

studies could be used to modify existing practices, create more consistent practices, and outline critical factors of learning that influence and account for the educational or employment benefits of co-op education (Ricks et al., 1990). Very little data exist for the educational and employment benefits of community college co-op graduates.

Need for New Knowledge

The need for more studies is conveniently linked to the need for the present research. With the growth in community college enrollment, co-op programs represent an opportunity to address the needs of the non-traditional student who desires to increase job skills, change careers, or both. There is a need to get the information to those outside the community college co-op community that co-op participation presents benefits not only for institutions, students, and employers but society as well (Hutcheson, 1996). The need exists to promote co-op because it has such great potential for retraining and re-education for the non-traditional student (Mosier, 1990). To promote co-op education adequately, co-op practitioners need more research to substantiate claims of benefits. Accountability, economy, and efficiency are closely tied to enrollment, and community colleges are enrollment driven (Mosier, 1990). Hard data are needed to document accountability and to substantiate claims. Accountability is not only desirable but has been mandated by the Educational Amendments of 1976 to show that co-op is good educational practice. This Amendment required states to plan frequent and constant evaluations of local activities and programs, including co-op programs, and to follow up with students who completed or left the program (Beilby et al., 1980, p. 57). Mandated accountability studies probably dictated the generation of follow-up studies in the previous years, and now the co-op

education community has a need for new knowledge that can be generated from follow-up studies.

There is also a need for new knowledge in community college co-op education based primarily on the changes in the workplace that have driven community college enrollment up. The new knowledge should be built on what educators already know about those who enroll in community colleges (Heinemann, 1988). Those who enroll in community colleges tend to be older and are more likely to be working than those who enroll in four-year colleges. As well, community college educators need to address the needs of the displaced worker, resulting from the high performance workplace (Hutcheson, 1995; Sovilla, 1988; Varty, 1988).

Summary

Chapter Two provided a review of co-op education literature. In light of the paucity of research that exists on community college co-op graduates' pursuit of education and achievement of salary gains, the present study was closely linked to related research on general populations of community college graduates' pursuit of additional education and four-year college co-op education graduates' salary gains. Specifically, co-op education was defined from different perspectives and the ways in which co-op education programs vary around the nation and the world. Defining co-op education from different perspectives provided insights into the interrelationships of the study's variables. The components of co-op education and the conceptual framework were presented. The interrelationships of the components were discussed in relation to the characteristics and activities that support the program and led to the hypotheses

(predicted outcomes) (Table 1.1). Finally, the chapter concluded with ways in which the literature points to the present study. Chapter Three provides a discussion and a description of the study's methodology.

CHAPTER THREE

METHODOLOGY

Background and Overview

The present study used a mail survey adapted from a telephone survey conducted by the NCCCS, which resulted in an unpublished report for the NCCCS, *Assessment of the Employment and Educational Impacts of Cooperative Education on Program Graduates* (Pumphrey & Wessels, 1995). In addition, data generated from the research was published in the *Journal of Cooperative Education* (Wessels & Pumphrey, 1995, 1996). As part of a federal grant received by the NCCCS, the Center for Urban Affairs and Community Services was contracted to conduct telephone surveys in 1993 and 1995. During the interviews, co-op education and non co-op education graduates of the North Carolina Community College System answered questions about initial job placement, job advancement, additional training, and longtime earnings (Pumphrey & Wessels, 1995). Statistical analysis of the data generated from these studies merged data from the interviews with the students' transcript files.

The follow-up study of cohorts was completed in 1995 as a way to validate the initial survey and to provide a longitudinal view of the earnings data. The target population used in the 1995 telephone survey conducted by the Center for Urban Affairs and Community Services is the same population that was used in the present research.

The 1993 and 1995 surveys focused on the impact of co-op education on job search time, quality of job placement, job advancement, and wage increases. The focus of the present study was additional education since graduation in 1987 and salary gains. The present study included three mailings to the target population beginning with 1,323 address verification cards and two mailings of the survey instrument. Data were collected and analyzed to describe the groups: (a) group 1 – co-op graduates from a school that offered co-op education; (b) group 2 – non co-op graduates from a school that offered co-op education; and (c) group 3 – non co-op graduates from a school that did not offer co-op education. Graduates were randomly selected from 11 colleges offering co-op education and from 11 colleges that did not offer co-op education. The previous researchers (Wessels & Pumphrey, 1995, 1996) selected colleges that were comparable in size, program offerings, urban and rural status, geographical location in the state, and similarity of both employment rates and weekly wages in the counties served. Using specific selection criteria for the colleges that did not offer co-op education was critical for the study, but the presence of group 3 was also critical as the control. "For reasons not fully understandable in the context of the study, students attending colleges that offered cooperative education appear to have benefited from the program's presence even though they did not directly participate in it" (Pumphrey & Wessels, 1995, abstract).

Research Methodology

The present research was an ex post facto design using surveys that described three groups of graduates from the North Carolina Community College System. Reliability, validity, and the sampling methods are the most important aspects of survey

research, and the researcher must ensure that the individuals who return surveys are representative of all individuals to whom the researcher wishes the results to apply (Slavin, 1984). The present research was a longitudinal survey in which graduates of the NCCCS in the academic year 1986-1987 reported information over a 10-year period of time, in 1992, 1995, and 1997. The focus of the study was not to show correlation or to present cause and effect but to describe the groups in terms of their pursuit of additional education and achievement of salary gains. This type of educational research often contributes to the theoretical understanding of the manner in which individuals, groups, and situations operate (Cates, 1985).

Hopkins and Antes (1990) explained ex post facto design in terms of treatment and response. In the present study, the treatment was co-op education, the independent variable, and the dependent variables were additional education and salary gains. "*Ex post facto* designs use the idea of treatment, except the control for the treatment variable is accomplished indirectly through the use of *a priori* classification of subjects to be studied" (Hopkins & Antes, 1990, p. 314). In the present study, the effects of co-op education on how graduates pursue additional education and achieve salary gains could not be studied by varying, at the researcher's will, the level of co-op participation. However, the 1986-1987 graduates could be assigned into like groups, and the researcher could study the groups for similarities and differences. Because the researcher could control conditions and assign levels on the independent variable, this design used the characteristics of an experiment, except for the lack of direct manipulation. Because the treatment levels were created by assignment rather than by manipulation, the control

needed to make direct statements about cause was not included for an assigned variable. This restriction was taken into consideration in drawing conclusions from results generated by the ex post facto statistical design, as suggested by Hopkins and Antes (1990).

Research Design

The independent variable was co-op education and the dependent variables were the pursuit of additional education and achievement of salary gains. The methodology used in this study was a survey of a stratified random sample of three strata. The three strata were (a) group 1 – co-op graduates from a school that offered co-op education; (b) group 2 – non co-op graduates from a school that offered co-op education; and (c) group 3– non co-op graduates from a school that did not offer co-op education in the North Carolina Community College System.

A survey of graduates from groups 2 and 3 generated data about community colleges that offered co-op education. These data were compared to data generated from surveys of graduates from group 3, the control group (non co-op graduates of a college that did not offer co-op education). A comparison among the three groups determined whether there were benefits for graduates who attended a college that offered co-op education but did not participate in co-op education.

Pilot Study

The survey was pre-tested with ten 1988 graduates (co-op and non-co-op) from Tillton Square Community College in Tillton, NC, to determine flaws that may have

existed. Pre-testing the survey helped to establish the instrument's face validity and gave feedback on the questions and format.

Selection of Subjects

The original data set from the 1993 and 1995 surveys were selected using stratified random sampling (Figure 3.1). The graduates in the study were stratified as a control for characterizing the three groups of graduates. The 1986-1987 graduates from the North Carolina Community College System totaled 13,375 for that academic year. The three categories were created on the basis of students' and schools' participation in co-op education. The target sample of co-op students numbered 900, and the experimental group totaled 900. The numbers of graduates were 900 for group 1, representing 7% of the total; 4,173 for group 2, representing 31% of the total; and 8,302 graduates for group 3, representing 62% of the total. Each group represented a layer (stratum) in the random selection process. Nine hundred graduates from each group were randomly selected for interviews, and 900 calls to each group were made because of the expected numbers of incorrect telephone numbers and the numbers of graduates who would choose not to participate in the survey or who would be unavailable.The target number of interviews was 2,000 and attempting 2,700 interviews would enable the researchers to come close to the target number of interviews. The actual number of interviews for the year 1993 totaled 1,575. In 1995, more interviews were attempted from the list of 1,575 names, and 1,323 interviews were completed.

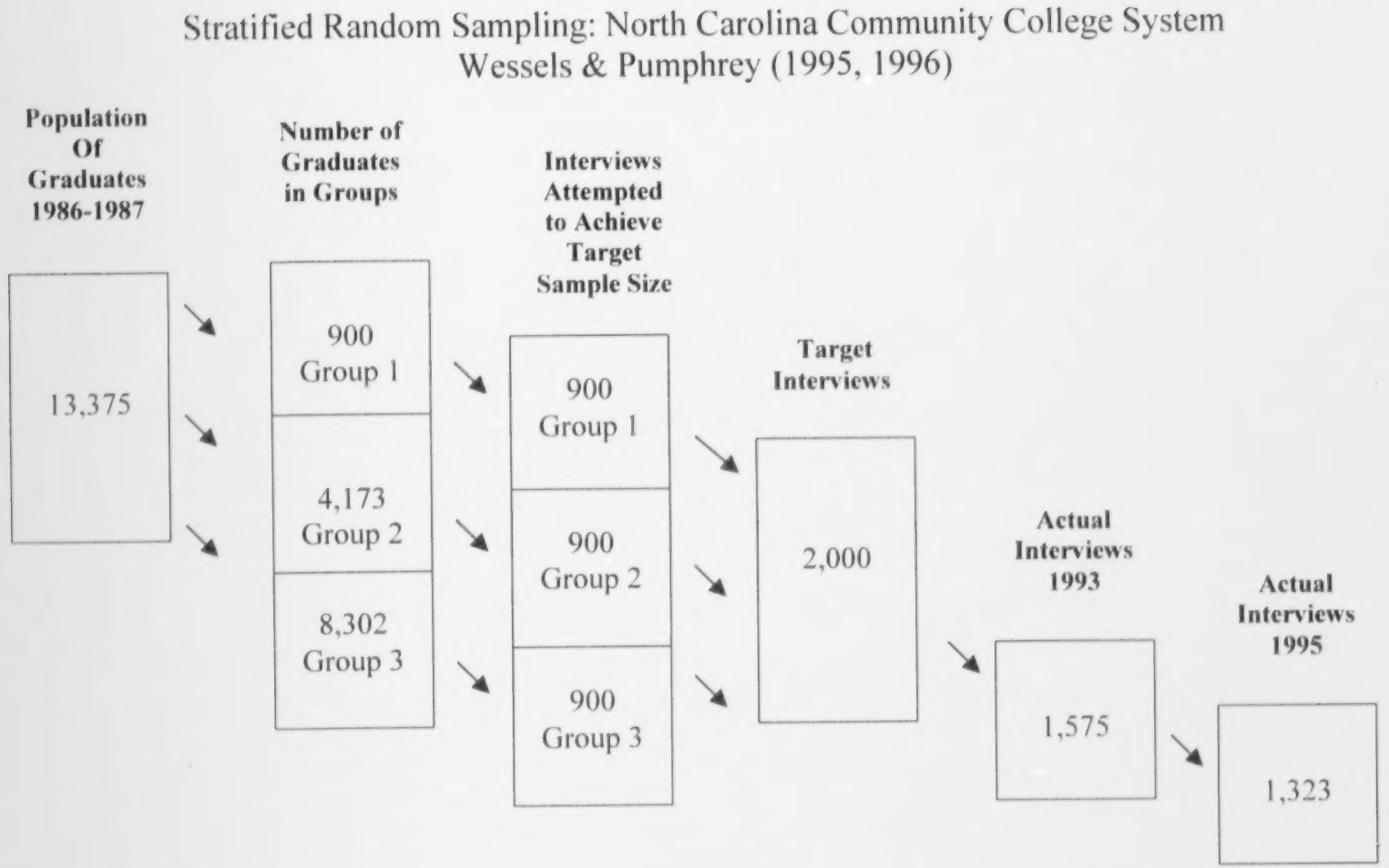

Figure 3.1. Stratified Random Sampling: Selection of graduates for research study "Assessment of the employment and educational impacts of cooperative education on program graduates" (Hopkins & Antes, 1990; Wessels &, Pumphrey 1995, 1996).

The graduates were divided into three strata as (a) group 1– co-op graduates from a school that offered co-op education; (b) group 2 – non co-op graduates from a school that offered co-op education; and (c) group 3 – non co-op graduates from a school that did not offer co-op education. To eliminate potential sources of bias in the data set, graduates of nursing and allied health programs were not included in the data set. Pumphrey and Wessels (1995) put forth efforts to eliminate potential sources of bias in the data set by not including graduates of nursing and allied health programs because some of the programs had clinical work experience and some had co-op programs. Those with clinical work experience were accredited by outside agencies or boards and those with co-op were not accredited. The researcher in the present study considered these facts to be "potential sources of bias in the data set," so the data set used here does not include nursing and allied health students (dental, phlebotomy, radiology, and medical technology). College transfer and general education program graduates were also excluded from the sample because they were ineligible for co-op education.

Graduates in the present study were last surveyed in 1995 by the Center for Urban Affairs and Community Services for the North Carolina Community College System. The list of graduates was secured from the Center for Urban Affairs and Community Services, with permission from the North Carolina Community College System. The sample of this present survey was 1,323 community college graduates who acquired Associate Degrees in Applied Science during the academic year 1986-1987. Twenty-two community colleges were selected for the survey, 11 of which offered a co-op education program and 11 of which did not offer a co-op education program. Pumphrey and

Wessels (1995) selected the 11 non co-op community colleges on the basis of size, program offerings, urban/rural status, and geographical location within the state, similarity of employment rates and weekly wages in counties served. A great advantage for the researcher, in the present study, in using this data set was that Wessels and Pumphrey (1995, 1996) provided great control for selectivity of students, that is the schools were in similar economic areas.

Instrument

The survey was comprised of some questions formerly used in the 1993 and 1995 surveys. The instrument was printed in an 11 x 17, four-page format, with a separate Scantron sheet inserted between the pages. The document was printed on ivory color heavyweight paper by the North Carolina Community College System. The researcher added questions suggested by Mr. Gerald Pumphrey (formerly associated with the North Carolina Community College System), Dr. Walter Wessels (economics professor with North Carolina State University), Dr. Don Tomakovic-Devey (social science methods professor), and Mr. Rick Shields (senior analyst with the Center for Urban Affairs and Community Services). The sequence of the questions from the previous survey was completely altered, some questions were deleted, and many questions were rephrased or divided into two separate questions. The researcher was granted permission by the NC Community College System to use the 1993 and 1995 instruments. A sample survey is in Appendix 2.

Graduates were asked to report additional education they have been acquired since graduation in 1986-1987 and the salary differences from the year of graduation to

the present. In most cases, responses were limited to *yes* or *no* and, in other cases, the respondents were asked to darken all applicable choices, using a #2 lead pencil.

Measures

Measures of Additional Education

The additional education section of the survey measured responses on the dependent variable (Table 3.1). Workplace changes and the tremendous increase in student enrollment in the community colleges demonstrated a need for these questions. In addition, the literature showed that other researchers have asked similar questions. For instance, among the questions that the Hudson River Center for Program Development (1996) suggested to include in follow-up surveys are (a) Are credentials being increasingly acquired? and (b) Do students have a good sense about what they need to do next: more schooling, more experience, learning other skills, etc.? (p. 12). The questions in the present study were reworded and reordered from Pumphrey and Wessels' (1995) survey. The written format for the interviewers of these items was modified from the previous questionnaires to fit the instrument design in the present study. Each question required a *yes* or *no* answer. The frequency of the responses was used to distinguish the three groups of graduates. A quantitative analysis was made for each response, and survey questions requesting information about additional education were used as an indicator for those researchers seeking to make determinations about those graduates who wanted to (a) better prepare themselves for the workforce, (b) increase their chances of being hired, (c) increase their chances for promotion, and (d) increase their chances for higher salaries (Conklin, 1992a; Hollins & Smith, 1986; Scheetz, 1989; Weintraub,1980).

Table 3.1

Research Questions on Additional Education

Research Question	Question Asked by Other Researchers
1. What proportion of graduates have completed additional education since their graduation?	Conklin (1992a, b); Hollins & Smith (1986); Pumphrey & Wessels (1995); Sheetz & Gardner (1989)
2. What proportion of graduates are currently pursuing additional education?	Conklin (1992a, b); Kane et al., 1984
3. What proportion of graduates have obtained a bachelor's degree or higher since graduation in 1987?	Conklin (1992a, b)

Employment experiences.

Items 33-48 measured the responses to the dependent variable, employment experiences, as seen in Component VI of the conceptual framework (Figure 1.2). These questions elicited information about the employment status of the population and point to benefits that are or should be derived from co-op participation. The Hudson River Center for Program Development (1996) suggested graduate follow-up students determine whether there is increased placement in high skill-high wage careers and whether there is increased job retention, job earnings, and employer satisfaction.

Items 21-30 measured employment status as full time/part time and salary history twice (1987 and 1997) after graduation. Answers to these questions help characterize the labor market faced by the 1987 graduates and advancements they have made in the 10 years since graduation. Researchers (Rowe, 1992; Wessels & Pumphrey, 1996) have

demonstrated that co-op graduates command a higher starting salary upon graduation, but the salary advantage is not maintained longer than 5 years (Table 3.2). This research seeks to determine whether co-op graduates with additional education demonstrate a salary advantage.

Table 3.2

Research Questions on Salary

Research Question	Question Asked by Other Researchers
4. What salary category had the highest frequency of graduates for 1987 and 1997?	Conklin (1992a , b); Gardner & Motschenbacher (1993); Roger & Weston (1987); Rowe (1992); Siedenberg (1989, 1990); Vickers (1990); Wessels & Pumphrey (1995, 1996)
5. What proportion of graduates indicated that their employers require completion of additional education to receive a salary increase?	None cited
6. What proportion of co-op graduates who have completed additional education have higher salaries than non co-op graduates with additional education?	None cited

Co-op Participation

The researcher confirmed the respondents' participation in co-op education by the response to Question 49, *Did you participate in a co-op education program prior to*

graduation in 1987? Answers were checked with information from the North Carolina Community College System. If the participant's answer did not agree with NCCCS data, the survey was eliminated. Co-op training, as presented in this study, is the independent variable that helps the student understand the link between school and work (Figure 1.2 and Table 1.1). Subsequently, the graduate is encouraged to seek additional education and thereby realizes employment benefits. Items 49-52 measured participation factors that were not used in Pumphrey and Wessels' (1995) previous data set (Table 3.3).

Table 3.3

Survey Questions on Co-op Participation

Survey Question	Question Asked by Other Researchers
• Did you participate in a co-op education program prior to graduation in 1987?	Were you required to take co-op education? (Kane et al., 1984)
• Were you encouraged by your cooperative education employer to continue your education beyond the associate's degree?	How much did your co-op coordinator encourage you to continue your education at a four-year school? (Kane et al., 1984)
• Were you employed full-time by your cooperative education employer immediately after graduation in 1987?	Pumphrey & Wessels (1995, 1996)
• Are you employed by your co-op education employer?	Pumphrey & Wessels (1995, 1996)

Co-op coordinators and supervisors should encourage students to seek additional education after graduation. Determining the extent to which these graduates felt this

objective has been accomplished would explain reasons why they have or have not acquired additional education.

If the graduate has remained permanently employed by the co-op employer, this would suggest that salary increases and promotions have not been given with the same frequency had the graduate changed employers. Wessels and Pumphrey (1995) explained this phenomenon because the variable remaining with co-op employer did not increase wages with the North Carolina Community College System graduates. For those graduates who remained with their co-op employer, co-op education "had a negative impact on all advancements for increased responsibility, better job match, and all advancements combined" (Wessels & Pumphrey, 1995, pp. 50-51). The researchers expected that, as with other populations of graduates on the first job after graduation, the co-op graduates would receive higher salaries and be given more responsibility with jobs that match their skills more so than non co-op graduates. Subsequently, during the early years of employment, graduates in this category would receive fewer advancements.

Data Collection

An address verification postcard (Appendix 2) was mailed to each graduate to verify the address, and those cards that were not deliverable were deleted from the list. Two surveys (Appendix 3) were mailed, with the non-respondents receiving a second survey. Each survey included a self-addressed stamped envelope, Scantron answer sheet, and letter of introduction (Appendix 3), and the second survey contained a self-addressed stamped postcard that could be returned if the respondent wanted his or her name to be deleted from the mailing list. Because these graduates have participated in two previous

surveys, a pre-contact letter was not sent. However, the front page of the survey and a letter of introduction were used to present the researcher, discuss the purpose of the study, and request cooperation. The introductory letter (Appendix 2) was signed by Dr. George Baker III, Executive Director of the National Alliance, Director of the NILIE, and this researcher. Each participant was asked to return the survey by a specified deadline. This study was sponsored by the National Alliance for Community and Technical Colleges, the National Initiative for Leadership and Institutional Effectiveness (NILIE), and the North Carolina Community College System. All agencies are in Raleigh, North Carolina.

As Scantron sheets were returned, the researcher inspected sheets to ensure that participants marked the responses appropriately. The community college school code and group number (1, 2, or 3) for co-op education participation were indicated on all answer sheets. Participant comments concerning questions asked, arrangement of questions, and the possible choices for responses on the survey were acknowledged. All surveys were saved for future reference.

Data Analysis

Analysis of the Pursuit of Additional Education

The researcher defined and analyzed the graduates' pursuit of additional education. Wessels and Pumphrey (1996, 1995) did not address findings from questions answered by graduates concerning additional education. The pursuit of additional education was measured on the basis of whether graduates were currently pursuing or

had completed work-related education and whether graduates had completed education that was work-related or unrelated to work.

Researchers show that having a knowledge of a graduate's pursuit of additional education can be used for various purposes: workforce development (Illinois, 1991); institutional effectiveness (Conklin, 1992a,b); college transfer rates (Kane et al., 1984); and the impact of co-op on academic and economic status of graduates (Wessels & Pumphrey, 1995). As previously stated, the focus of the present study is to document accountability and to promote co-op education by substantiating claims of co-op benefits.

In the nearly 30 years since Cross's (1971) *Beyond the Open Door*, the literature suggests that there has been a change in the value that open enrollment students place on academic achievement (Congress of the US, 1995; Cross, 1971; Heinemann, 1988; Mercer, 1994; NC Fact Book, 1996). Cross (1971) contended that open enrollment students, who were likely not to be high academic achievers, saw no value in higher education but attended college primarily to improve their economic standing. Heinemann (1988) stated, "Since a significant number of students [community college] enter educationally underprepared, they are more likely to withdraw or be dismissed as a result of poor academic work" (p. 50). More recent publications, Mercer (1994) and the NC Fact Book (1996), have indicated that the numbers of enrolled community college students have outpaced those at four-year colleges and universities, with 60% of the nation's college students in community colleges. Although the numbers of open enrollment students outnumber those at four-year institutions, the question can be asked

whether the open enrollment students are completing associate degrees and going on to transfer to four-year institutions.

Few articles in the literature report on the extent to which community college students or graduates pursue additional education and receive salary gains. For that reason, variables measured in the present study were currently pursuing work-related additional education, completed work-related education with salary gains, and completed education unrelated to work.

Court and Connor (1994) contended that community college students are not likely to complete a bachelor's degree if they started at the community college.

> Among those community college students whose goal is a bachelor's degree, the chances of eventually attaining that degree is reduced for those who begin their studies at two-year colleges; students entering two-year colleges tend to have lower levels of educational and degree attainment than do comparable individuals who enter four-year institutions. (Pascarella & Terenzini, 1991, p. 373).

Heinemann (1988) supported the premise that attrition is a problem for the open enrollment student. "Those students [open enrollment] whose objective is to transfer to a four-year college may decide to do so prior to completing the associate's degree" (p. 50). In contrast to findings of Court and Connor (1994) and Heinemann (1988), Pumphrey and Wessels (1995) contended that a subgroup of open enrollment students, co-op education students, received higher grades, were more likely to graduate, and completed more course work" at a statistically significant higher level than did non co-op students

(p. 39). The results of research studies presented here suggest a need to include the variable, credential received since graduation during the academic year 1986-1987.

The hypotheses for this portion of the study were developed to test the first set of research questions concerned with the general level of additional education and subsequent salary increase. The hypotheses were as follows:

1. H_0^1: There is no salary difference in the proportion of co-op and non co-op graduates who have completed additional education.

2. H_0^2: There is no difference in the proportion of co-op and non co-op graduates currently pursuing additional education.

3. H_0^3: There is no difference in the proportion of co-op and non co-op graduates who have received a bachelor's degree or higher since graduation in 1986-1987.

4. H_0^4: There is no difference in the salary category of co-op and non co-op graduates for 1987 and 1997.

5. H_0^5: There is no difference in the proportion of co-op graduates and non co-op graduates who indicated that their employers require completion of additional education to receive a salary increase.

6. H_0^6: There is no significant salary difference in the proportion of co-op and non co-op graduates for 1987 and 1997 who have completed additional education.

A chi-square analysis was conducted on the data collected in this portion of the survey. Significance was reported at $p \leq .05$. If levels occurred with $p \leq .01$ or $p \leq .001$, this was also reported.

Analysis of Salary Gains

Wessels and Pumphrey (1996) examined the present population of co-op and non co-op graduates used in the present study. Wessels and Pumphrey's (1996) wage results revealed that the direct effect of co-op, as reflected by co-op graduates, had a negligible (0.3%) and insignificant effect on wages. The institutional effect, reflected by co-op school, showed co-op education raising wages of all students by 1.8%, a result that did not reach statistical significance ($p \leq 0.43$). For those co-op graduates who remained with their co-op employer, co-op had little effect on wages. The 1996 wage results of the present population did not reflect salaries of co-op and non co-op graduates who had received additional education since graduation. Therefore, the researcher added another variable to the present study, salary difference with additional education: H_0^2: There is no salary difference in the proportion of co-op of co-op graduates and non co-op graduates who have completed additional education.

Grubb (1992) stated, "In general, community college educators believe in the lure of the post-secondary education, which is to have faith that more schooling automatically leads to higher earnings. This belief in more school and higher earnings is not always justified at the community college level" (p. 226). Grubb (1992) further stated that receiving returns from credentials at the sub-baccalaureate level varies and depends on the academic major and the type of institution (community college, technical college or proprietary school). Grubb (1992) stated that despite the expansion of two-year institutions and proprietary schools, and the group with "some college, there has been

little analysis of the economic returns to these forms of post-secondary education (p. 226).

Chi-square analysis was conducted on the data collected in this portion of the survey. Significance was reported at $p \leq .05$. If levels occurred with $p \leq .01$ or $p \leq .001$, this was also reported. The list of graduates was checked to make sure that it included only graduates for the 1986-1987 academic year. Graduates unemployed for the year 1997 were not included in the determination of the salary gain. The means for the salaries could not be compared because the categories were ordered.

Wilson (1989) recommended that investigators generate more theory-based co-op research. The hypothesis that co-op graduates pursue more additional education and receive higher salaries might be explained by the human capital theory if the researcher's objective is to present the cause and effect of the salary gains, as Wessels and Pumphrey did (1995, 1996). The aim of previous research (Wessels & Pumphrey, 1996) was to determine the impact of co-op on wages. The human capital theory treats education as an investment of time and money and postulates that it earns a return as higher wages. Results from Wessels and Pumphrey's (1996) study suggest cooperative education did increase wages immediately after graduation but this direct effect does not appear to last.

Demographics

The demographics of the survey are important from the standpoint of gender and salary advantage. Wessels and Pumphrey (1996) stated that the impact of co-op education comes in large part from its presence upon the campus, the institutional effect. The 1993 data samples showed that females at community colleges that offer co-op

programs earned more (Pumphrey & Wessels, p. 36). This finding may result from the external effects of co-op education in motivating the faculty to relate their instruction to the workplace. The results showed that this significant result held up in the 1995 sample. The researchers examined not only females but other subgroups, such as nonwhites, those living at home when entering their major, and those not working when entering their major. Only the females had a significant difference when the three groups of females were compared to each other. The impact of co-op education on males was not significant. On the other hand, the impact of co-op education on those females who enrolled in co-op was small and insignificant, but the impact of co-op education on all females attending a college that offered co-op was large (almost 7%) and close to significance. Wessels and Pumphrey (1995) used what they called a combined [institutional and direct] impact of co-op education on females which was higher (8%) for female graduates from a co-op college than for female graduates from a non co-op college and significant at the $p \leq .036$. When their results from 1993 were compared to the 1995 results for females, the co-op schooling effect for females persisted. Being a female and a graduate of a co-op program increased the hourly wage by 8.6% in 1993, and it jumped to 9.8% in 1995. Attending a college that offered co-op increased female wages by 5.48% in 1993 and 6.4% in 1995 (Wessels & Pumphrey, 1995).

Limitations

Hopkins and Antes (1990) stated, "All studies are limited in some way, because the perfectly reliable and valid study is yet to be developed" (p. 105). By listing limitations, the researcher recognizes particular places where methodology is less than

ideal and may result from inadequate procedures that cannot be made adequate, the nature of the questions asked, or the population being studied.

Slavin (1984) stated, "In survey research, the most important tasks are to be sure that the measures being used are reliable and valid, and to be sure that the individuals from whom we receive surveys are representative of all individuals to whom we wish the results to apply" (p. 70). Reliability, validity, and sampling for the present study have all been critically examined to determine if they represent limitations.

Reliability

Response effect errors represent a weakness in some survey research because of a reluctance of respondents to report negative information (Fletcher, 1988). This type of response effect error might have occurred in the present study for at least two reasons. The first reason is that respondents might have been reluctant to indicate they were not currently pursuing additional education at the time the survey was received nor had they completed additional education. The second reason that respondents might have been hesitant to give negative feedback is that their salaries for 1987 and 1997 did not indicate an obvious increase. Graduates might add to or omit information from a survey to present themselves in the best image.

Response effect errors might also occur because of a lapse of memory or misinterpretation of questions asked. Because the researcher requested information from the last 10 years, memory errors may have occurred. Graduates might not remember whether they enrolled in specific types of courses or whether training was completed. Determining the salary for the first job after graduation in 1986 or 1987 and the salary for

1997 might have also been cause for other memory-dependent response effect errors. Cates (1985) stated, "Researchers recognize that respondents may intentionally or unintentionally supply inaccurate information" (p. 98). For this reason, in this study, the researcher did not make emphatic statements concerning salary but stated that respondents indicated a specific salary category or indicated achievement of a specified level of additional education.

Validity

Validity is evaluated in terms of two possible sources of weakness, and a research design must satisfy these criteria if it is to add knowledge regarding effects from within the experimental design, internal validity, and effects from outside, external validity (Hopkins & Antes, 1990, p. 318). Internal validity refers to the degree to which a research design rules out explanations for a study's findings, other than that the variables involved appear to be related because they are in fact related. Slavin (1984) defined external validity, or generalizability, as the degree to which the findings of a particular study using a particular sample have meaning for other settings or samples, particularly setting or samples in which the researcher has practical interest.

Internal Validity

Threats to internal validity that are applicable to the present study include questions related to income for the year 1987 and 1997. Wessels and Pumphrey (1996) asked questions about salary but determined an exact figure (the hourly wage). The graduates in the present study were questioned about salary but were asked to indicate a category or range in salary, which was not an exact figure. Thus, the salary figures for the

present study were less precise and posed difficulties in supporting statements about salary averages and gains.

External Validity

External validity represents an issue in the present research because co-op education programs statewide, nationally, and internationally vary in many perspectives. As seen in Appendix 1, some students were able to enroll in as many as seven co-op work periods, which might imply that as graduates they might have had very different experiences (Hutcheson, 1996). Cates (1985) stated that "the degree to which a study is externally valid is determined by the extent to which the researcher can state that its findings are applicable to samples and populations other than the sample used in the study" (p. 135), often referred to as the generalizability of the findings (Slavin, 1984). The objective of this researcher was to do as most educational researchers do, which is to characterize the three groups and then allow the reader to decide to what other populations the results might apply.

Good Samples

When considering whether the individuals from whom the researcher receives surveys are representative of all individuals to whom the researcher wishes the results to apply, sampling must be considered. A good response rate for surveys is always desired but may not be achieved. The population of North Carolina Community College System graduates for the academic year 1986-1987 totaled 13,375. To achieve at least 2,000 interviews, 900 calls were made from each group (Fowler, 1992, personal communication). Consequently, 900 graduates were randomly selected from group 2,

totaling 4,173 graduates and 3, totaling 8,302 graduates. Random selection was not appropriate for group 1 because the total number of co-op graduates was 900. Even though groups 2 and 3 may represent good samples of the population, group 1 actually represents the whole population of co-op graduates.

Summary

The North Carolina Community College System in Raleigh, North Carolina, conducted a telephone survey of 1986-1987 graduates to compare co-op and non co-op students and the respective categories of colleges. The survey was conducted in 1993 and 1995. The present study was a follow-up of the 1995 survey. The present study was an ex post facto study that described the groups but did not show cause and effect of the dependent variables indicated for co-op education. The independent variable was co-op education and the dependent variables were additional education and salary gains. The groups were divided into three strata: group 1 – co-op education graduates of a school that offered co-op education; group 2 – non co-op graduates of a school that offered co-op education; and group 3 – non co-op graduates from a school that did not offer co-op education. A determination was made as to differences and similarities of groups. The survey was pre-tested with ten 1988 graduates (co-op and non co-op graduates from Tillton Square Community College in Tillton).

CHAPTER IV

RESULTS

Sample

The Center for Urban Affairs and Community Services of North Carolina State University in 1995 completed 1,323 telephone interviews in a second survey of 1986-1987 graduates. The graduates were divided into three strata: group 1–students who graduated from community colleges with co-op programs, group 2--non co-op students who graduated from community colleges with co-op programs, and group 3–graduates from community colleges without co-op education.

The sample in the present study comprised the 1,323 community college graduates who had received associates degrees in applied science during the academic year 1986-1987 and who had been surveyed in 1995. These graduates had graduated from 22 community colleges, selected by Pumphrey and Wessels (1995), 11 of which offered co-op education programs and 11 of which did not. In the present study, of the 1,323 names of graduates received from the Center for Urban Affairs and Community Services, 259 mailed surveys were received after two mailings, for a response rate of 38%. Wessels and Pumphrey (1995) reported a response rate of 51.8% and 84% for their 1993 and 1995 telephone surveys, respectively.

Of the 259 surveys received, 1 survey was received too late for inclusion in the statistical analyses and 17 surveys were unuseable because of inconsistencies in answers about their co-op education participation. A table of school codes established by the

Center for Urban Affairs and Community Services with response rates for the present study is presented in Table 4.1.

Table 4.1

North Carolina Community College School Codes

School Code	Surveys Used	Total Respondents %
30	16	6.6
70	10	4.1
90	9	3.7
130	16	6.6
170	27	11.2
230	2	0.8
270	9	3.7
290	2	0.8
310	21	8.7
330	18	7.5
370	16	6.6
440	8	3.3
460	1	0.4
530	4	1.7
570	6	2.5
630	16	6.6
750	14	5.8
770	8	3.3
850	13	5.4
890	22	9.1
970	2	0.8
990	1	0.4

Note. $N = 241$.

The majority of respondents were Caucasian (n = 202, 87.1%) between the ages of 31 and 40 (n = 73, 48.5%) and female (n = 134, 57.8%). The low 38% response rate and the high percentages of both Caucasians and women in the sample make it difficult to generalize the findings (Table 4.2). As in the present study, the majority of respondents in Wessels and Pumphrey's (1996) study were also Caucasian (82.5%). Unlike the present study, the numbers of females (50.5%) and males (50.5%) in their sample were nearly equal.

Table 4.2

Demographics of the Sample

Variable	Respondents n (%)
Age (years)[a]	
30 or under	10 (4.2)
31 to 40	115 (48.5)
41 to 50	73 (30.8)
51 to 59	31 (13.1
60 or more	8 (3.4)
Gender[b]	
Female	134 (57.8)
Male	98 (42.2)
Ethnic Group[b]	
Caucasian	202 (87.0)
African American	19 (8.2)
Other	8 (3.4)
Asian American/ Pacific Islander	2 (0.9)
Hispanic	1 (0.4)

[a] N = 237, because 4 participants did not respond. [b] N = 232, because 9 participants did not respond.

Additional Education and Salary Gains

General Analysis

Chi-square analyses were performed on the responses to survey questions. Contingency tables show frequency counts and percentages. Responses to survey questions were tabulated according to the three groups: group 1–co-op graduates from a college that offered co-op, group 2–non co-op graduates from a college that offered co-op, and group 3–non co-op graduates from a college that did not offer co-op. This analysis required that cells in the contingency tables include at least 5 responses to insure that chi-square analysis was appropriate. Results for all survey questions are not given, and, in some instances, results from other studies are provided. Results of analyses are presented according to the hypothesis being tested.

Additional Education Hypotheses

Hypothesis 1

Null hypothesis 1 stated that there would be no significant differences in the percentages of co-op and non co-op graduates who had completed additional education since their graduation in 1987. Results of chi-square analysis showed no significant differences among the three groups, therefore the null hypothesis was accepted. The percentages of graduates from groups 1, 2, and 3 who completed additional education were 87.30%, 90.91%, and 84.44%, respectively (Table 4.3).

Table 4.3

Additional Education

Hypothesis	Group 1: Co-op Grad/Co-op School *n* (%)	Group 2: Non Co-op Grad/Co-op School *n* (%)	Group 3: Non Co-op Grad/Non Co-op School *n* (%)	χ^2 (2)
H_o^1: There are no significant differences in the percentages of co-op and non co-op graduates who have completed additional education since their graduation.	55 (87.30)	80 (90.91)	76 (84.44)	.425
H_o^2: There are no significant difference in the percentages of co-op and non co-op graduates who are currently pursuing additional education.[a]	16 (26.23)	24 (28.57)	17 (19.23)	.345
H_o^3: There are no significant differences in the percentages of co-op and non co-op graduates who have received bachelor's degrees or higher since graduation in 1987.	11 (17.46)	27 (30.68)	18 (20.00)	.109

$p \leq .05$. [a] Missing values = 8.

About half the graduates from each of the three groups (50.79%, 54.55%, and 55.56%, respectively) completed only work-related education (Table 4.4). A smaller percentage of the graduates from each group (33.33%, 28.41%, and 26.67%) completed both work-related and non work-related education. A much smaller percentage of graduates completed education that was only non work related (3.17%, 7.95%, and 2.22%, respectively).

Table 4.4

Additional Education Completed by Group

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Education Type	*f*	%	*f*	%	*f*	%
Both work-related & non work-related	21	33.33	25	28.41	24	26.67
Non work-related	2	3.17	7	7.95	2	2.22
Work-related	32	50.79	48	54.55	50	55.56
None	8	12.70	8	9.09	14	15.56

χ^2 (6, N = 241) = .444, p = .05.

As in Pumphrey and Wessels' (1995) findings, the top choice of additional education favored by the 1986-1987 graduates in the present study was on-the-job training by the work-site superviser (52.7%) (Table 4.5). On-the-job training supported

by outside contractors (44.4%) was the next highest choice. A larger percentage of graduates had completed additional education at community colleges (32%) than at four-year institutions (26%). Only 15.8% of the graduates had completed education at business, technical, or proprietary schools.

Table 4.5

Sources of Work-Related Additional Education Completed

	Responses	
	Yes	No
Sources	*n* (%)	*n* (%)
On the job (work-site supervisor)	127 (52.7)	114 (47.3)
On the job (outside contractor)	107 (44.4)	134 (55.6)
Community college	78 (32.4)	163 (67.6)
Four-year college	62 (25.7)	179 (74.3)
Other (satellite, correspondence, VCR, on-line, television, etc.	40 (16.6)	201 (83.4)
Business, technical, proprietary school	38 (15.8)	203 (84.2)
Military service	6 (2.5)	235 (97.5)
Junior college	2 (0.8)	239 (99.2)

Note. $N = 241$.

When comparing the three groups, a significantly larger number of male graduates from group 1 than from groups 2 or 3 had attended business, technical, or

proprietary schools. A significant difference was found among the three groups of male graduates attending business, technical, or proprietary schools, χ^2 (2, N = 18) = .017, p < .05.

When asked which factors influenced their pursuit of additional education, circumstances, such as new job opening, relocation, downsizing, or raising children, had the highest percentage of responses (47.7%) (Table 4.6). The next highest influence was the employer (37.3%).

Table 4.6

Influence on Pursuit of Education

	Responses	
	Yes	No
Influence	*n* (%)	*n* (%)
Circumstances (new job opening, relocation, downsizing, raising children)	115 (47.7)	126 (52.3)
Employers	90 (37.3)	151 (62.7)
Relatives	37 (15.4)	204 (84.6)
College faculty	35 (14.5)	206 (85.5)
Spouse	33 (13.7)	208 (86.3)
Other employees	32 (13.3)	209 (86.7)

Note. Percentages may not total 100%, because respondents could give more than one response.

Hypothesis 2

Null hypothesis 2 stated that there would be no significant differences in the percentages of co-op graduates who would be pursuing additional education. Results of chi-square analysis showed no significant difference among the three groups of graduates, χ^2 (2, N = 57) = .345, $p \leq .05$. For those 57 graduates, 26.2% of group 1, 28.6% of group 2, and 19.2% of group 3 were currently pursuing additional education. For those graduates, both males and females, who were pursuing additional education at the time of the survey, the source of additional education was on-the-job training provided by the work-site supervisor.

When comparing females to females among the three groups in the current study, the percentages of females pursuing additional education at the time of the survey were 29.41% (10) for group 1, 19.05% (8) for group 2, 18.18% (10) for group 3 (18.18%), but they were not significantly different, χ^2 (2, N = 28) = .412, $p \leq .05$. On-the-job training provided by the work-site supervisor (12.8%) ranked highest as the source among the females. Community colleges and distance-learning courses had the third and fourth highest percentages, 6.61% and 5.66% respectively. Four-year colleges (3.03%) were ranked very low among the female graduates.

The average number of males among all three groups currently pursuing additional education was 26.82%, and no significant difference was found. On-the-job training provided by work-site supervisor was higher among males (18.32%) than among females (12.8%) in all three groups. More males (17.35%) than females (8.22%) responded that their additional education came from on-the-job training provided by

contractors. The percentages of males and females pursuing additional education at community colleges were 6.86% and 6.61%, respectively. Slightly more females (5.66%) than males (4.66%) were utilizing distance learning to gain additional education. More males (4.66%) than females (3.09%) were seeking additional education at four-year colleges. None of these data refuted the null hypothesis, therefore, the null hypothesis was accepted.

Hypothesis 3

Null hypothesis 3 stated that there were no significant differences in the percentages of co-op and non co-op graduates who had received a bachelor's degree or higher since their graduation in 1987. Results of chi-square analysis ($\chi^2 = .109$, $p \leq .05$) showed that fewer co-op than non co-op graduates had attained a bachelor's degree or higher since graduating in 1987 (Tables 4.3 and 4.7). Therefore, the null hypothesis was accepted.

Table 4.7

Graduates Completing a Bachelor's Degree or Higher

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Bachelor's Degree	*f*	%	*f*	%	*f*	%
Yes	11	17.46	27	30.68	18	20.00
No	52	82.54	61	69.32	72	80.00

χ^2 (2, N = 241) = .109, $p \leq .05$.

When comparing the graduates among all three groups, 17.46% of group 1 (co-op graduates from a co-op college), 30.68% of group 2 (non co-op from a co-op college), and 20% of group 3 (non co-op from a non co-op college) had obtained a bachelor's or higher degree.

Comparisons of females and of males were made among the three groups by types of credentials received by each since graduation (Table 4.8). There were no significant differences for females among the three groups, for males among the three groups, or between males and females among the groups. When comparing among all three groups of graduates, both males and females, who had earned credentials, 38.2% (92) had earned certificates, 22.8% (55) had received a bachelor's degree, 7.5% (18) had received an associate's degree, and 2.9% (7) had received a graduate degree. Also, respondents were asked if a professional license or certificate was required by their present or a previous job. Seventy-three (30.1%) said that a license or certificate was required.

Graduates who had not received credentials were also compared (Table 4.9). Results of chi-square analysis showed only the male graduates approached significance, χ^2 (2, n = 98) = .095.

Table 4.8

Comparisons among Groups by Gender and by Credentials Received since 1987

		Group					
		1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Credentials	χ^2 (2)	*f*	%	*f*	%	*f*	%
		Females					
Certificate	.4091	16	45.71	15	34.88	18	32.14
Associates	.6640	1	2.86	3	6.98	4	7.14
Bachelor's	.4617	5	14.29	11	25.58	11	19.64
Graduate	.0566	2	5.71	0	0.00	0	0.00
		Males					
Certificate	.9527	10	41.67	16	39.02	14	42.42
Associates	.9815	2	8.33	4	9.76	3	9.09
Bachelor's	.4902	5	20.83	13	31.71	7	21.21
Graduate	.6868	1	4.17	3	7.32	1	3.03

$p \leq .05$.

Table 4.9

Male Graduates Who Had Not Received Credentials since 1987 by Co-op Group

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Not Received Credentials	*f*	%	*f*	%	*f*	%
Yes	6	25.00	7	17.07	13	39.39
No	18	75.00	34	82.93	20	60.61

χ^2 (2, $N = 98$) = .095, $p \leq .05$.

Salary Gains Hypotheses

Hypothesis 4

Null hypothesis 4 stated there were no significant differences in the salary category for the 1987 and 1997 co-op and non co-op graduates. This hypothesis was derived from studies (Gardner & Motschenbacher, 1993; Gardner, Nixon, & Motschenbacher, 1992; Rogers & Weston, 1987; Wessels & Pumphrey,1996) that suggested "co-op graduates tend to have somewhat higher starting salaries in their first job after graduation" (Congress of the US, 1995, p. 68). The second part of Hypothesis 4 (there were no differences in the percentages of the 1997 co-op and non co-op graduates' salary category) was derived from other studies (Wessels & Pumphrey, 1996) that suggested a salary advantage may not persist for some populations of graduates.

Salaries of the three groups of graduates were analyzed, and the results are presented in a contingency table. The initial tables had 15 categories of salaries that were subsequently reduced to three categories that had five or more responses in a cell to ensure that a chi-square analysis was valid. Exact salaries (hourly, weekly, monthly, or yearly) were not used.

Results (Table 4.10) did not refute the null hypothesis for 1987 graduates, because there were no significant differences in the 1987 salaries of the graduates. When comparing the salary categories for 1987, 85.15% of the graduates earned less than $25,000 a year; 13.26% earned between $25,000 and $50,000 a year; and 1.59% earned greater than $50,000 a year.

Table 4.10

Salary Differences by Co-op Group and Year

		Co-op Group		
Hypothesis	Salary (yearly $)	1: Co-op Grad/Co-op School *n* (%)	2: Non Co-op Grad/Co-op School *n* (%)	3: Non Co-op Grad/Non Co-op School *n* (%)
	1987[a]			
H_0^1: There are no significant differences in the percentages of co-op and non co-op graduates in the variable salary category.	< 25,000	48 (84.21)	67 (83.75)	70 (87.50)
	25,001–50,000	7 (12.28)	12 (15.00)	10 (12.50)
	> 50,000	2 (3.51)	1 (1.25)	0.00
	1997[b]			
H_0^3: There are no significant differences in the percentages of co-op and non co-op graduates in the variable salary category.	< 25,000	19 (33.93)	23 (28.75)	25 (31.25)
	25,001–50,000	31 (55.36)	42 (52.50)	47 (58.75)
	> 50,000	6 (10.71)	15 (18.75)	8 (10.00)

[a] χ^2 (4, N = 217) = .507. There were 24 missing responses. [b] χ^2 (4, N = 217) = .515. There were 25 missing responses.

Increase in salaries but no differences among the groups.

Ten years after graduation, the three groups of graduates still did not demonstrate a significant salary difference. The salaries had increased in that a higher percentage of graduates indicated their annual salaries were between $25,000 and $50,000, rather than under $25,000. When comparing salary categories for 1997 to those for 1987, a smaller percentage (31.31%) of the graduates earned less than $25,000 in 1997. A higher percentage (55.54%) of graduates in 1997 than in 1987 earned salaries between $25,000

and 50,000. The percentage of graduates in 1987 indicating that their salaries were greater than $50,000 increased from 1.59% in 1987 to 13.15% in 1997 (Table 4.10).

Salaries of female graduates.

To document claims made by Gardner and colleagues (1992) and Wessels and Pumphrey (1996) that co-op education has a positive and significant impact on the salary of females, a contingency table was constructed that compared salaries of female graduates among the three groups for 1987 and for 1997 (Table 4.11). When comparing the salaries of the three groups of females for 1987, there were no significant differences.

Table 4.11

Female Salary Differences by Co-op Group and by Year

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Annual Salary	*f*	%	*f*	%	*f*	%
			1987[a]			
< $25,000	31	96.88	40	97.56	45	91.84
$25,001–50,000	1	3.13	1	2.44	4	8.16
> $50,000	0	0	0	0	0	0
			1997[b]			
< $25,000	18	58.06	19	47.50	22	43.14
$25,001–50,000	12	38.71	18	45.00	26	50.98
> $50,000	1	3.23	3	7.50	3	5.88

[a] χ^2 (2, n = 122) = .394, $p \leq .05$. There were 12 missing responses. [b] χ^2 (4, n = 122) = .717, $p \leq .05$. There were 12 missing responses.

For 1987, the year after graduation from a community college, 95.08% (116) of the females indicated that they earned salaries that were less than $25,000; 4.92% (6) indicated that they earned salaries ranging from $25,001 to $50,000, and none of the females indicated that they earned salaries greater than $50,000 (Table 4.12).

Table 4.12

Salary Differences Year and Gender

	Gender			
	Female		Males	
Annual Salary	*f*	%	*f*	%
	1987[a]			
< $25,000	116	95.08	64	72.73
$25,001–50,000	6	4.92	23	26.14
> $50,000	0	0.00	1	1.14
	1997[b]			
< $25,000	59	48.36	7	7.95
$25,001–50,000	56	45.90	60	68.18
> $50,000	7	5.74	21	23.86

[a] χ^2 (2, n = 210) = .001, $p \leq .05$. There were 31 missing responses. [b] χ^2 (2, n = 210) = .001, $p \leq .05$. There were 31 missing responses. Degrees of freedom differ because no females in 1987 were earning more than $50,000.

For the year 1997, 10 years after graduation from a community college, the percentage of females indicating that they earned salaries less than $25,000 decreased from 95.08% to 48.36%. The percentages of females in 1997 indicating that they earned

from $25,001 to $50,000 and those earning greater than $50,000 both had increases since 1987, with the largest increase occurring in the category from $25,001 to $50,000.

Salaries of male graduates.

When comparing salaries of the male graduates among the three groups for 1987, there were no significant differences, with 72.73% of the graduates indicating that their salaries were less than $25,000; 26.14% of the male graduates indicating that their salaries ranged from $25,001 to $50,000; and 1.14% of males indicating that their salaries were greater than $50,000 (Table 4.13)

Table 4.13

Male Salary Differences by Co-op Group and by Year

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Annual Salary	*f*	%	*f*	%	*f*	%
			1987[a]			
< $25,000	15	68.18	24	68.57	25	80.65
$25,001–50,000	6	27.27	11	31.43	6	19.35
> $50,000	1	4.55	0	0	0	0
			1997[b]			
< $25,000	1	4.55	3	8.11	3	10.34
$25,001–50,000	16	72.73	23	62.16	21	72.41
> $50,000	5	22.73	11	29.73	5	17.24

[a] χ^2 (4, n = 88) = .361, $p \leq .05$. There were 10 missing responses. [b] χ^2 (4, n = 88) = .745, $p \leq .05$. There were 10 missing responses.

When comparing 1987 to 1997 salaries for males graduates among all three groups (Table 4.12), male salaries had increased in 1997 in the categories $25,001 to $50,000 and greater than $50,000. There was a large decrease in the percentages of males (7.95%) earning less than $25,000 among all three groups when compared to 1987 figures (72.73%).

Comparisons were made between the salaries of females and males among all three groups for 1987 and for 1997 (Table 4.12). The salaries were significantly different, χ^2 (2, N = 210) = .001, p < . 05, for both 1987 and 1997.

In determining the 1997 salaries of graduates in the current study, the unemployed graduates were eliminated. The graduates who were unemployed in 1987 were not determined. The unemployed were defined as retired, between jobs (laid off), or looking for employment. Therefore, the rate of unemployment among the graduates was important. With all graduates examined, 11.7% were unemployed, 9.1% were retired, and 2.5% were laid off (Table 4.14). Unemployment in 1997 was 17.78% for group 3, which was close to significance at .077. According to U.S. Department of Commerce (1998), unemployment in 1987 was 6.2% of the labor force, and in 1997 it was 4.9% of the labor force.

Table 4.14

1997 Employment by Co-op Group

	Group					
	1: Co-op Grad/ Co-op School		2: Non Co-op Grad/ Co-op School		3: Non Co-op Grad/ Non Co-op School	
Employment	*f*	%	*f*	%	*f*	%
Employed	57	91.94	80	91.95	74	82.22
Unemployed	5	8.06	7	8.05	16	17.78

χ^2 (2, N = 230) = .077, p < .05. There were 2 missing responses.

Hypothesis 5

Null hypothesis 5 stated that there were no significant differences in the percentages of co-op and non co-op graduates whose employers required additional education for a salary increase. This hypothesis was derived from employment practices within the state of North Carolina and from Hamilton and Hamilton's (1997b) study that maintains that to secure a job that pays well, one must be well educated. Chi-square analysis was conducted on the data, and the data are summarized in Table (4.15). The null hypothesis was accepted, because there were no significant differences among the three groups.

Table 4.15

Salary and Education by Co-op Group

		Co-op Group		
Hypothesis	Salary (yearly $)	1: Co-op Grad/Co-op School *n* (%)	2: Non Co-op Grad/Co-op School *n* (%)	3: Non Co-op Grad/Non Co-op School *n* (%)
H_0^5: There are no significant differences in the percentages of co-op and non co-op graduates whose employers require additional education for a salary increase.[a]		13 (20.97)	23 (26.74)	15 (17.05)
	1987[b]			
H_0^6: There are no significant salary differences in the proportion of co-op and non co-op graduates who have completed additional education.	< 25,000	42 (82.35)	60 (88.33)	60 (86.96)
	25,001–50,000	7 (13.73)	11 (15.28)	9 (13.04)
	> 50,000	2 (3.92)	1 (1.39)	0 (0.00)
	1997[c]			
H_0^6: There are no significant salary differences in the proportion of co-op and non co-op graduates who have completed additional education.	< 25,000	18 (36.00)	21 (29.17)	22 (31.43)
	25,001–50,000	26 (52.00)	39 (54.17)	40 (57.14)
	> 50,000	6 (12.00)	12 (16.67)	8 (11.43)

[a] χ^2 (2, N = 51) = .296. There were 5 missing responses. [b] χ^2 (4, N = 211) = .537. There were 19 missing responses. [c] χ^2 (4, N = 211) = .840. There were 19 missing responses.

Hypothesis 6

Null hypothesis 6 stated that there were no significant salary differences in the proportion of co-op and non co-op graduates who had completed additional education. This hypothesis was derived from claims that co-op education prepared students for "high-skill, high wage" jobs (Congress of the US, 1993, abstract; Gardner & Motschenbacher, 1997). A contingency table was established with the 1987 and 1997 salaries of graduates who had completed additional education (Table 4.15). Grubb (1992) stated that "In general, community college educators believe in the lure of the post-secondary education, which is to have faith that more schooling automatically leads to higher earnings" (p. 226). The null hypothesis was accepted, because the salaries of graduates with additional education were not significantly different among all three groups for both 1987 and 1997. Having obtained additional education since graduation in 1987 did not afford the co-op graduates an advantage over the non co-op graduates with additional education.

When comparing 1987 to 1997 salaries, 8.08% more graduates from group 1 earned greater than $50,000 in 1997 than in 1987; 15.28 % more from group 2; and 11.43% more from group 3. Of note is that, in 1997, more graduates (nearly 50%) from group 3 were retired, looking for work, or had been laid off.

Summary

A follow-up survey of 1986-1987 North Carolina Community College System graduates resulted in 259 completed mail surveys, 241 of which were acceptable for analysis using SAS chi-square. Contingency tables were used to test the hypotheses

related to additional education pursued and salary gains obtained within 10 years since graduation in 1987. Graduates were selected using stratified random selection and were divided into 3 strata: group 1–co-op graduates from a college that offered co-op education, group 2–non co-op graduates from a college that offered co-op education, and group 3–non co-op graduates from a college that did not offer co-op education.

The null hypotheses presented in the current study suggested that no significant differences would exist among the three groups, so far as the proportion of co-op and non co-op graduates who (a) had completed additional education since graduation, (b) were currently pursuing additional education, (c) had received bachelor's degrees or higher, (d) had earned higher salaries since graduation, (e) were required by employers to obtain additional education for a salary increase, and (f) had earned a higher salary because of additional education. Results of chi-square analysis failed to refute the null hypothesis in each test.

Although the results of chi-square did not refute the null hypotheses, significant differences not addressed by the hypotheses or those approaching significance were discovered among the groups. For example, a higher number of males from group 1 (co-op graduates from a college that offered co-op) completed additional education at business, technical, and proprietary schools, and the result was significant, χ^2 (2, n = 57) = .017, p = ≤. 05). A higher number of males from group 3 (non co-op graduates from a college that did not offer co-op education), did not receive credentials in the 10 years since graduation, and the difference approached significance, χ^2 (2, n = 57) = .093, $p \leq .05$. Male salaries were significantly higher than female salaries for both 1987 and

1997, χ^2 (2, N = 210) = .001, $p \leq .05$, with 31 missing values. More graduates in group 3 (non co-op graduates from a college that did not offer co-op education) were unemployed in 1997. Unemployment was defined as retired, between jobs (laid off), or looking for employment. The difference approached significance, χ^2 (2, N = 239) = .077, $p \leq .05$, with two missing values.

Though there were no significant differences in salaries among the three groups for 1987 and 1997, more graduates in group 2 (non co-op graduates from a college that did offer co-op education) indicated that they had an increase in salary. The salary gain issue was addressed by comparing the percentage of graduates within each group that moved into a higher salary category from 1987 to 1997. Without considering additional education obtained, group 2 still experienced more of an increase in salary because 15.28% more graduates moved into the greater than $50,000 range, as compared to 8.08% for group 1 and 11.43% for group 3.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Overview of Study and Findings

In this study, the researcher examined the additional education pursued and salary gains obtained by 1986-1987 graduates of the North Carolina Community College System. The 241 respondents comprised three groups of graduates: group 1–co-op graduates from a college that offered co-op, group 2–non co-op graduates from a college that offered co-op, and group 3–non co-op graduates from a college that did not offer co-op. Rapid changes in technological developments and changes in the workplace evidence an increased need for additional education.

A subsequent increase in community college enrollment suggests that improved co-op programs are needed now more than ever before, but community college student participation in co-op education is experiencing a decline. Therefore, this study sought to (a) address accountability of co-op education at the community college level, (b) determine the extent to which community college co-op graduates pursue additional education and achieve salary gains, (c) provide the North Carolina Community College System with outcome data for 1987 co-op and non co-op graduates at least 10 yeas after graduation, (d) report the proportion of graduates currently pursuing additional education, (e) report the proportion of graduates who have obtained a bachelor's or higher degree since graduation in 1987, and (f) provide long-term salary data for the 1987 graduates.

The mail survey in this study served as a way to determine academic and economic trends in the workplace and to identify ways graduates may have benefited from co-op participation. Results of the follow-up study for the 1986-1987 graduates of the North Carolina Community College System indicate that 10 years after graduation from a North Carolina community college, there are no significant differences in the three groups of graduates in the hypotheses tested. Statistical differences did exist in areas not addressed by the hypotheses, and these results are discussed in the conclusions.

Conclusions

Additional Education Hypotheses

Responses of the total population of North Carolina Community College System graduates indicated that 88% completed additional education (work-related or unrelated to work) since graduation. There were no significant differences among the three groups. That 88% of graduates who completed additional education within 10 years after graduation can be compared to 36.25% of the same sample 6 years after graduation and 51.10% of the same sample 8 years after graduation in 1987 (Wessels & Pumphrey, 1995, 1996).

At the time of the present study, 24% of the total population of graduates were pursuing work-related additional education with no significant differences in the three groups of graduates. That 24% of the total population of graduates were enrolled in additional education classes at the time of the survey can be compared to 21.6% at Johnson County Community College (1990), 28.8% at Illinois Community College Board (1996), and 22% reported in Sheetz and Gardner (1989). Since graduation from a

North Carolina community college in 1987, 23% of the total population has completed a bachelor's degree, with no significant differences among the three groups. The findings of the present study have been tied together in relation to rationale for questions and the hypotheses, theory, and review of the literature (Figure 5.1).

Hypothesis 1

Null hypothesis 1 stated that there were no significant differences in the percentages of co-op and non co-op graduates who had completed additional education since their graduation in 1987. The rationale for this hypothesis was to document claims of student benefits for co-op education participation. The National Commission for Cooperative Education (1994a) has made claims that co-op education promotes lifelong learning. Pumphrey and Wessels (1995) examined the 1986-1987 North Carolina Community College System graduates and found statistically significant differences between the co-op and non co-op students. The co-op students obtained higher grades, were more prone to graduate, and finished 2.8 more terms of course work than the non co-op graduates did. The likelihood for graduating increased from 15% to 43% (Pumphrey & Wessels, 1995). The conceptual framework established the theory that integrating school and work continues after graduation. This theory, supported by literature, led to the formulation of the null hypotheses.

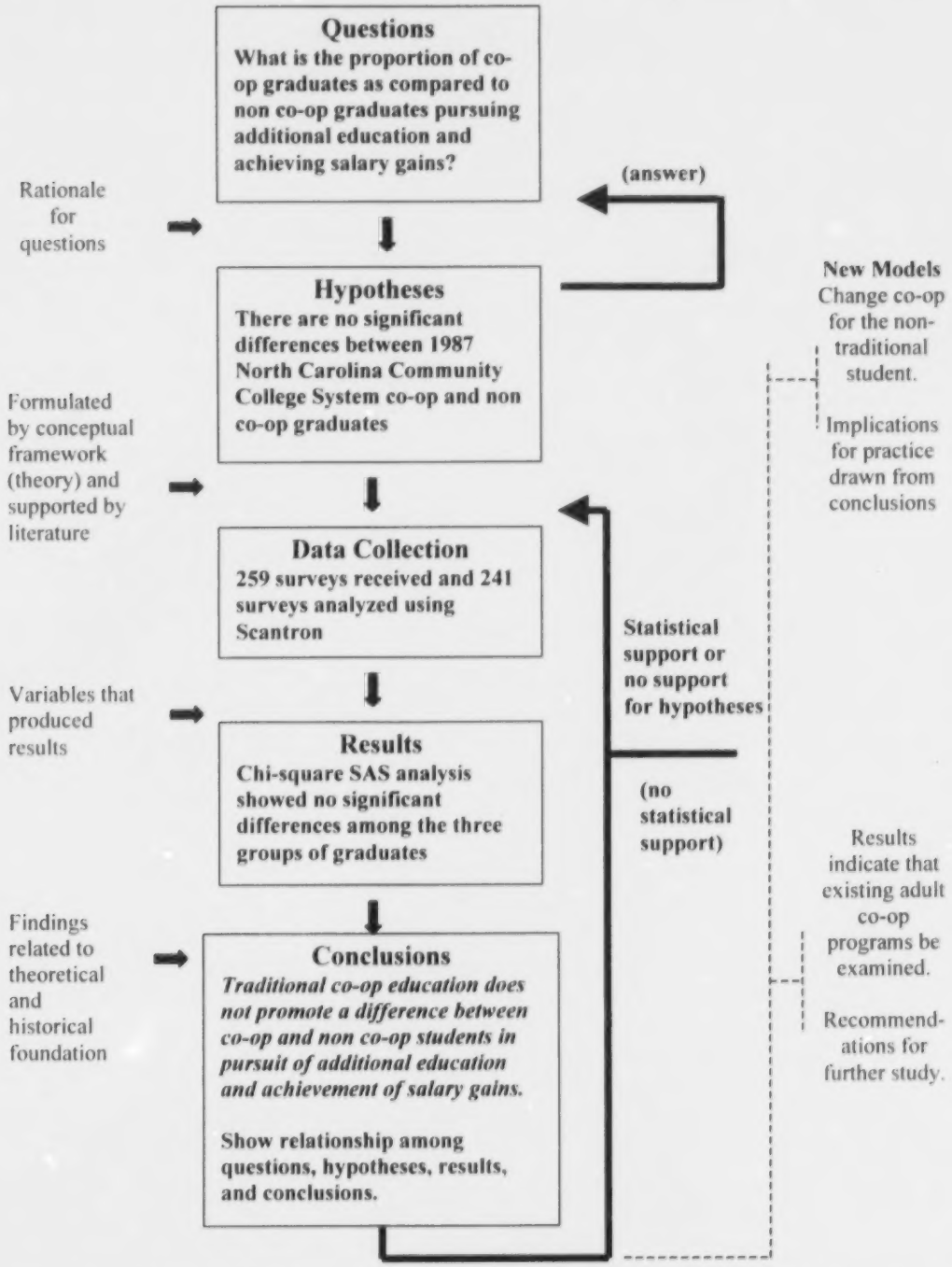
Questions
What is the proportion of co-op graduates as compared to non co-op graduates pursuing additional education and achieving salary gains?
(answer)
Rationale for questions
Hypotheses
There are no significant differences between 1987 North Carolina Community College System co-op and non co-op graduates
New Models
Change co-op for the non-traditional student.
Implications for practice drawn from conclusions
Formulated by conceptual framework (theory) and supported by literature
Data Collection
259 surveys received and 241 surveys analyzed using Scantron
Statistical support or no support for hypotheses
Variables that produced results
Results
Chi-square SAS analysis showed no significant differences among the three groups of graduates
(no statistical support)
Results indicate that existing adult co-op programs be examined.
Findings related to theoretical and historical foundation
Conclusions
Traditional co-op education does not promote a difference between co-op and non co-op students in pursuit of additional education and achievement of salary gains.
Show relationship among questions, hypotheses, results, and conclusions.
Recommend-ations for further study.

Figure 5.1. Relationships established among the questions, hypotheses, results, and the conclusions for the dissertation.

Adapted from text: Hopkins, R. L. & Antes, F. E. (1990). *Educational research. A structure for inquiry* (3rd ed.), Peacock Publishers, Inc., Itasca, IL, p. 357.

Co-op education programs are designed to guide students to pursue additional education as an important part of the co-op experience. This guidance would help them prepare for job loss, job reassignment, and company budget cutbacks. Theoretically, the classroom instructor and the workplace coordinator, manager, coach, or mentor should encourage co-op students to continue education beyond the associate's degree. Data analysis from the current study shows that 13.73% (7) of co-op graduates said their co-op employers encouraged them to continue beyond the associate's degree and 86.27% (44) answered no.

The results of the survey indicated that 87.30% (55) of group 1, 90.91% (80) of group 2, and 84.44% (76) from group 3 completed additional education. Stern and colleagues (1997) suggested that co-op education programs emphasize the work-based learning and not the academic component. They further contended that co-op education graduates are therefore "more oriented towards employment than towards academic pursuits" (Stern et al., 1997, p. 226). But the data in this study do not suggest that graduates from either group 1 or group 2 are ahead of group 3 in their pursuit of additional education but neither are they behind. The null hypothesis is accepted, therefore no significant differences exist in the proportion of co-op and non co-op graduates who have completed additional education since their graduation.

Hypothesis 2

Null hypothesis 2 in this study stated there were no significant differences in the percentages of co-op and non co-op graduates who were currently pursuing additional education. Community college leaders need to know how many 1987 graduates are

currently pursuing additional education, so that they can adapt co-op education to fit the needs of the current student population. Knowing the extent to which graduates are pursuing education 10 years after graduation may help administrators in offering appropriate courses. Additional research at other intervals could provide better data for analysis.

The hypothesis was derived because of claims made by researchers that co-op education increases opportunities for further education or training and helps students gain basic skills to pursue further education and lifelong learning (Congress of the US, 1993; Halperin, 1994; Imel, 1995).

Integration of school and work is a major concept of the conceptual framework. The theories upon which co-op education is built suggest, as has been shown in at least one study, that students whose work is part of their education, unlike their working peers whose work is unrelated to schooling, are somewhat more likely to want additional education (Heller & Heinemann, 1987). Not all researchers agree with Heller and Heinemann. For example, according to Stern and colleagues (1997), "previous studies have consistently found that co-op graduates are more likely to work and less likely to continue in higher education than their non co-op schoolmates" (p. 214). From results in the present study, the researcher believes that this is probably true during the first year after graduation rather than in later years, because 10 years after graduation, 87.3% of these graduates had completed additional education.

Responses in this study suggest that there are no significant differences between co-op and non co-op graduates who were pursuing additional education at the time of the

survey. Chi-square analysis showed that 26.23% (16) from group 1 (co-op graduates from a college offering co-op), 28.57% (24) from group 2 (non co-op graduates from a college offering co-op), and 19.23% (17) from group 3 (non co-op graduates from a college that did not offer co-op) were pursuing education at the time this survey was administered. The null hypothesis is accepted and no significant difference exists between co-op and non co-op graduates who were pursuing additional education.

Hypothesis 3

Null hypothesis 3 stated that there were no significant differences in the percentages of co-op and non co-op graduates who had received a bachelor's degree or higher since graduation in 1987. Hypothesis 3 grew out of a need for empirical research that would assess whether community college co-op graduates continue to enhance their learning and achieve professional gains after graduation.

Researchers (Beilby et al., 1980; Boesel et al., 1994; Heinemann, 1988; Inger, 1995; Loken, Cutt, & Lumsden, 1996; Ricks, 1996; Wilson, 1988; Wilson, Stull, & Vinsonhaler, 1996) maintain that assessments of co-op education graduates pursuit of additional education are scant. The Hudson River Center for Program Development (1996) also supported a need to test this type of hypothesis and suggested that follow-up surveys ask co-op graduates if they are acquiring certificates or credentials. Branton and colleagues (1990) suggested that co-op students more so than non co-op students retain more information from classroom and work experience and apply knowledge more effectively. Further, co-op students more so than non co-op students have greater

confidence, perceive themselves as more capable, are better motivated, and are more independent.

These theories, which are the underpinning of the conceptual framework, suggest that more graduates from group 1 (co-op participants from a college that offered co-op) would have obtained a bachelor's degree or higher than graduates from group 2 (non co-op graduates from a college with co-op) or group 3 (non co-op graduates from a college without co-op).

In disagreement with Branton and colleagues (1990), Court and Connor (1994) contended that community college students are not likely to complete a bachelor's degree if they started at the community college. Chi-square analysis of the data presented in the present study indicates that there is no difference between the proportion of co-op and non co-op graduates who have received a bachelor's degree or higher. Of the respondents, 17.46% (11) from group 1, 30.68% (27) from group 2, and 20.00% (18) from group 3 received a bachelor's degree or higher.

For hypotheses 1-3 in this study, group 2 (non co-op graduates from a college with co-op) demonstrated a higher percentage and frequency than did graduates from groups 1 and 3. The frequencies were higher but were not significant by the standards set at the beginning of the study and did not approach significance. However, had there been higher numbers of respondents in this study, the presence of an institutional effect (indirect) of co-op education, whereby students who attend a college that offers co-op may experience advantages, might have been found. The suggestion that higher numbers of respondents might have indicated an indirect institutional effect is speculative and

goes beyond what the data suggest. In any case, the null hypothesis is accepted and no significant difference exists between co-op and non co-op graduates who have received a bachelor's degree or higher since graduation in 1987.

Salary Gains Hypotheses

Hypothesis 4

Hypothesis 4 stated there were no significant salary differences in the percentages of co-op and non co-op graduates for 1987 or 1997. This hypothesis first originated because of controversy surrounding the salary advantage that co-op graduates may or may not experience. Researchers (Gardner & Motschenbacher, 1993; Gardner, Nixon, & Motschenbacher, 1992) have shown that, immediately after graduation, co-op graduates, in some cases, experience salary advantages. Investigators have also shown that the salary advantage slowly disappears over time (Gardner & Motschenbacher, 1993; Gardner, Nixon, & Motschenbacher, 1992; Rogers & Weston, 1987; Wessels & Pumphrey, 1996).

The purpose for testing hypothesis 4 is to provide program planners in the North Carolina Community College System with information consistent with priorities established by the United States Department of Education, Title VIII Higher Education Act of 1965 (Cooperative Education Program, 1991). Among the priorities is to conduct longitudinal studies that reveal long-term earnings and academic achievement of co-op graduates compared to non co-op graduates.

Co-op education programs are committed to work-based learning and to helping graduates obtain jobs directly after graduation. In theory, this commitment to

employment may afford co-op graduates a salary advantage in some cases. According to Stern and colleagues (1997), co-op graduates are more likely to go to work directly after graduation and less likely to continue in higher education. Thus, co-op graduates may have the higher salary during the first year of graduation. Another theory (Stern et al., 1997) is the possibility that because of an influence of the administration of program procedures, there is no association between co-op participation and wages at the community college level. Stern and colleagues (1997) claimed that, at the post-secondary level, administration of program procedures is not as effective as in the high schools where graduates do demonstrate salary advantages.

Results presented in the present study suggest that no significant salary differences exist among all three groups for 1987 and 1997. These findings are supported by results of the previous study, Wessels and Pumphrey (1996), which indicated that the participation in co-op education "had a negligible (.3%) and insignificant effect on wages" (p. 44).

The major field of study may not be the only factor that influences salaries. Other possible influences are academic ability, the industries in the locale, region of the county, and the labor market conditions (Somers, 1995; Siedenbery, 1990). Researchers may also need to consider if individuals are employed in professional, technical, or managerial positions (Somers, 1995).

The data in the present study do not suggest that co-op graduates experienced a salary advantage either during the year of graduation or 10 years later. Moreover, 10 years after graduation, no differences remain in the percentages of graduates who were

enrolled in additional training at agencies or institutions at the time of the study. However, one might reason that if graduates were full-time students, they would demonstrate a lower salary than full-time employees would. The data in the study did not refute the null hypothesis.

Hypothesis 5

Null hypothesis 5 stated that there were no significant differences in the percentages of co-op and non co-op graduates whose employers required additional education for a salary increase. This hypothesis was derived from several claims pointing to employers' demand for and support of additional education for workers, chi-square analysis and contingency tables showing frequencies were used.

Claims have been made that job loss, job reassignment, and company budget cutbacks, along with longer life spans, have increased job competition. Increased job competition has increased both the levels and types of employer investment in employee training (Gardner & Tyson, 1994; Vary, 1994; Vaughan & Berryman, 1989). In the present study, the researcher theorized that the increased levels and types of employer investment in training are now required for salary increases.

The emphasis on the tremendous increase in community college student enrollment suggests that employers who require employees to acquire additional education for salary increases might be responsible for the increase in enrollment. Enrollment growth for community colleges has "outpaced increases at four-year colleges" with 60% of the nation's college students now enrolled in community colleges (Mercer, 1994; NC Fact Book, 1996).

Although chi-square analysis in this study shows no significant differences in co-op and non co-op graduates whose employers require additional education for a salary increase, the test does not indicate that a substantial number of employers require additional education for a salary increase. Reviewing the responses of the three groups of graduates shows that 20.97% (13) from group 1, 26.74% (23) from group 2, and 17.05% (15) from group 3 said that additional education was required for a salary increase.

One can infer that, although overwhelming numbers of employers do not require additional education for salary increases, additional education may be needed if workers are to remain competitive in the marketplace. Zdorkowski and Thomas (1984) suggested that the keys to success in this millenium are an adequate foundation of skills, continuous learning, and a willingness to alter career goals. Hamilton and Hamilton (1997b) maintained that to secure jobs that pay well, one must be well educated. Employers have long supported training efforts through on-site or off-site systems (Hoerner & Wehrley, 1995; Hutcheson, 1995; Vaughan & Berryman, 1989; Zdorkowski & Thomas, 1984).

Results in the present study also show that on-the-job training (work-site supervisor, 52.7%; outside contractors, 44.4%) was the most common way of attaining additional education. Of the 1987 North Carolina Community College System graduates in this study, an average of 21.59% of the graduates said their employers required additional education for a salary increase. The null hypothesis is accepted, because no differences exist between co-op and non co-op graduates whose employers require additional education for a salary increase.

Hypothesis 6

Null hypothesis 5 states that there were no significant salary differences in proportion of co-op graduates and non co-op graduates who had completed additional education. The rationale for hypothesis 6 was to document claims that co-op graduates obtain high-skill, high-wage jobs. The achievement of high-skill, high wage careers has been part of the Hudson River Center for Program Development (1996) list of questions to document benefits derived from co-op education participation. For those co-op graduates who experience a salary advantage over the non co-op, theory suggests that with additional education the advantage would be maintained. Further reasoning for the hypothesis originated from other researchers who have used pursuit of additional education as a way for determinating information about graduates who want to (a) better prepare themselves for the workforce, (b) increase their chances of being hired, (c) increase chances for promotion, and (d) increase their chances for higher salaries (Conklin, 1992a; Hollins & Smith, 1986; Scheetz & Gardner, 1989; Weintaub, 1980). According to Grubb (1992), community college educators believe that post-secondary education automatically leads to higher earnings, but "this belief in more schooling and higher earnings is not always justified at the community college level" (p. 226).

Chi-square analysis of the salaries of graduates indicates no significant salary differences for either the 1987 or 1997 graduates. The null hypothesis is accepted; therefore no significant differences exist between the salaries of co-op graduates and non co-op graduates who have completed additional education.

Implications

Although the responses given by the 1986-1987 North Carolina Community College System graduates in the current survey do not suggest outcomes that can be used to promote academic and economic benefits of co-op education, the study's findings provide a foundation from which further research can be conducted. For example, other factors, such as race, gender, and GPA, need to be considered. Perhaps research that examines new ways of defining co-op education based on information provided by employers, students, and institutions could help to demonstrate a significant difference between co-op and non co-op in their pursuit of additional education and achievement of salary gains.

Need for Additional Education

A large percentage (88%) of the total population of graduates have completed additional education in the 10 years since graduation from a community college. The findings suggest a change in the value that open enrollment students place on academic achievement (Congress of the US, 1995; Mercer, 1994; NC Fact Book, 1996). This change may result from the change in the community college student population. During the early years of community college and co-op, the student population was young and inexperienced, but now the average student is over 25 and has both job experience and family responsibilities.

When comparing the 88% rate of education completed in the present study to results from Pumphrey and Wessels (1995), the 1993 rate was 36.25% and the 1995 rate was 51.10%. This increase suggests that community college administrators could safely

design special programs for the returning community college graduates. Addressing the needs of the returning graduate could greatly increase enrollment in co-op education programs.

At the time of this survey, 24% of the graduates were currently enrolled in classes, even though they had completed an associate's degrees 10 years prior. That the graduates were continuing their education implies that community colleges and co-op education administrators could address the needs of that group by modifying existing programs to address issues of retraining and re-education for the non-traditional student (Mosier, 1990).

Community colleges seek to serve as stepping-stones to four-year colleges. The results of this study show that 23.2% of the population had completed a bachelor's degree or higher in the 10 years since their graduation. This number and the handwritten survey comments from the respondents imply that community college leaders' efforts to make four-year colleges accessible are not working. Graduates want to obtain a bachelor's degree from their local community college, be able to transfer more of their community college credits to a four-year college, and be able to afford a bachelor's degree. Of particular note is the percentage of graduates (7.5%) who returned to obtain a second associate's degree. This low percentage may mean that obtaining another associate's degree is not useful or that graduates find few programs that offer courses during the evening hours to fulfill degree requirements.

That these three groups of graduates had finished an associate's degree 10 years ago may explain the finding that the certificate was the credential most frequently

obtained during the 10-year period. Along those same lines, the type of additional education most often acquired by the graduates was on-the-job training (provided by the work supervisor), in which the graduate does not pay for the training. Respondents in the present study expressed a concern for affordable education. Most of the graduates at the time of the survey were between 31 and 40 years of age, which suggests that their lives might be more complex with family and job commitments that hindered their academic advancements.

Despite the lack of significant differences in salary data in the current study, a salary advantage may exist for graduates who participated in co-op education during the early 1980s. The population of community college students might have comprised more traditional students who were 18 years of age and lacked job experience. At present, co-op students are older, over 25 years of age, and possess job experience before entering the program. The non co-op graduate may now have just as much job experience or more as the co-op graduate because they are both, on average, non-traditional students. The salary results in the present study suggest that co-op education proponents need to find other benefits to promote and increase student participation in co-op.

Additional Education without a Salary Advantage

Despite 23.2% of the graduates having a bachelor's degree or higher, the co-op graduate still did not demonstrate a salary advantage. Within the co-op group, 87.3% of the graduates completed additional education, but a large percentage of the education was on-the-job training. Grubb (1992) states that the "belief in more school and higher earnings is not always justified at the community college level" (p. 226). The results also

imply that other variables, such as locale, academic major, national or local income levels, might have been considered that would have revealed salary advantages. For instance, according to the United States Census Bureau (1997), the 1997 median household income was not statistically different from its 1989 pre-recessionary peak ($37,303). Moreover, when comparing incomes for 1995-1996 and 1996-1997, the real median household increased for 12 states, including North Carolina. Therefore, incomes for 1997 in regions, except the Northeast, were up.

The percentage (21.59%) of respondents who indicated their employers require additional education for a salary increase is significant enough that it should not be ignored. This information suggests that co-op education proponents could partner with employers. This partnership could help employees to complete additional education and, in turn, employers would be helping increase co-op student participation at the community college level.

Limitations

The extent to which the results of the present study were influenced by the limitations identified earlier in the study is re-evaluated here. The results might have been affected by less than ideal sampling techniques and flaws in methodology and statistical design.

The less-than-ideal sampling techniques involve graduates in group 1. Random selection of group 2 (non co-op graduates from a college that offered co-op) and group 3 (non co-op graduates from a college that did not offer co-op) was appropriate because the total population for each was 4,173 and 8,302, respectively. Nine hundred graduates were

randomly selected from each group in the initial study (Pumphrey & Wessels, 1995; Wessels & Pumphrey, 1995, 1996). The co-op graduates were not randomly selected because, initially, there were only 900 co-op graduates and all were used in the 1993 and 1995 studies. The co-op graduates were also used in the current study. According to Stern and colleagues (1997), "a major difficulty in previous research on co-p has been non-random selection of students" (p. 214).

Gardner, Nixon, and Motschenbacher (1992) maintained that a comparison of the means in their study showed that co-op participants with one or two experiences (terms) did not demonstrate a salary advantage over the non co-op graduates in the first year after graduation. Co-op graduates who had experienced three quarters or more of co-op education demonstrated higher starting salaries than the non co-op graduates did. Starting salaries continued to increase up to five experiences. At this point, a threshold or optimum point was reached, after which the marginal change in salary was negative. Graduates who had more than five experiences still made significantly higher salaries than those with three or fewer experiences (Gardner, Nixon, & Motschenbacher, 1992).

In the present study, the researcher made the assumption that all co-op experience included no more than two terms, so that the sample of co-op graduates would be homogeneous. Not having completed more than two co-op experiences might explain why the co-op graduates did not demonstrate a salary advantage over the non co-op graduates for 1987 or 1997.

The methodology limited the study somewhat because a mail survey was used instead of the telephone survey previously used (Pumphrey & Wessels, 1995; Wessels &

Pumphrey 1995, 1996). The response rate was reduced because of the large number of undeliverable addresses (at least 400). Rossi, Wright, and Anderson (1983) suggested other limitations with mail surveys are people moving and not leaving a forwarding addresses and people receiving surveys and then misplacing, damaging, or completely destroying them by mistake.

In the present survey, the researcher did not use exact figures for salary. Pumphrey and Wessels (1995, 1996) had used exact figures (hourly and weekly wages). The respondents in the present study indicated their salaries by choosing categories of salaries for 1987 and 1997. Exact figures were not used in chi-square analyses in the current study, making it difficult to demonstrate salary advantages or gains. Furthermore, to assure that the chi-square analysis was appropriate and valid, the researcher had to make certain that at least five graduates fell in each salary category. This requirement reduced the number of salary categories from 15 to 3.

Generalizability

This researcher has characterized the three groups of graduates from the 1986-1987 North Carolina Community College System. Variability that exists in co-op education programs statewide has been discussed and tabulated (Appendix 1). As in the case with other researchers and the manner in which studies have been conducted, the reader must decide to what other samples or populations the results in this study may apply.

Recommendations

For Practice

The theory and practice of co-op education warrant change based on the results of this study. Hopkins and Antes (1990) stated that non-supporting or non-significant "results provide an opportunity to reflect on theory and to reconsider it in light of the newly obtained information" (p. 359). Academic and economic benefits may not be outcomes that community college leaders can use to promote co-op education.

The research findings suggest a revision of current theories that suggest co-op encourages the pursuit of additional education and achievement of salary gains. The findings of this study suggest that co-op should address the needs of the adult learner to increase student participation. New research is needed to explore the co-op concept. The lives of adult learners are complex with components that may add to or distract from learning. Improved practices and innovative co-op education models could be researched with practical suggestions for implementing co-op program revisions. Non-traditional students in the community colleges today are older students with families, including those who are single parents or who have been stay-at-home moms who are now returning to the workplace. These students usually attend college part-time and are generally older than traditional students who are employed full time and are interested in enhancing their present careers or changing careers. In contrast to the traditional community college student who has little work experience, the non-traditional student may have several years of work experience and has decided to begin a bachelor's degree

through the college transfer system. Again, additional research is required to deal with these complex variables.

A significant percentage (30%) of community college students considered non-traditional already possess bachelor's degrees and may be interested only in acquiring job-related technical skills that cannot be acquired at the four-year institution (Puyear, 1997). Four innovative co-op education models proposed in this study could be researched to determine the extent to which participation in community college co-op meets the needs of an expanding population. These models are the Extended Day Program, the Four-year Bound Program, the Bachelor's Plus Program, and the Returning Workers Program. Community colleges willing to test any of the models presented can show their commitment to increasing student participation and creating better programs.

The Extended Day Program

The data from the current study suggest that the practice of co-op education could be changed through using new models. For many years, students have been taking classes during the evening, but those classes may not have been part of a structured program. This program ties in their on-going class work, with new career goals, and a structured work experience that allows students to learn new skills on the job. Employers cooperate in work assignment and supervision, and students receive coordinator assistance, job placement, and counseling services from the college. Further research is required to determine the effects of these curriculum models.

Heerman (1973) stated that "co-op education for evening students is relatively new, but movements in this direction will surely be rapid" (p. 110). At the time of this

writing, a five-college consortium in California was offering the Extended Day Program. More than 4,000 (45%) students were enrolled, and the program was tailored to full-time students. The evening or extended-day is conditioned on the presence of an aggressive cooperative staff, a local institutional commitment to upgrading its employees, a definable student need, and close cooperation among the three parties (Figure 5.2).

The student benefits because his work experience is applied toward degree requirements. The program schedule for students could depend upon the flexibility of employers. Some firms feel that this education is so valuable that the employee is granted release time during the day, whereas other institutions prefer that classes be taken in the evening. Firms working on multiple shifts could be especially adaptable to such a program. This program offers the college the potential of expanding its services to a student clientele that heretofore was incompletely served.

The Experiential and Adult Learning Program at Monroe Community College in Rochester, New York, represents an innovative change in the Extended Day Program or Evening College, discussed in the literature as early as 1973. The Extended Day Program allows the student to use his or her full-time job as the work-based component of co-op education and to receive college credit during the evening (Coast Community College District, 1973). In the past, the adoption of this program has not been widespread but Monroe's adult co-op program has been successful since its inception 6 years ago. The program has a semester-long management seminar held once a week. Topics could include leadership, management style, power, team building, and organizational structure.

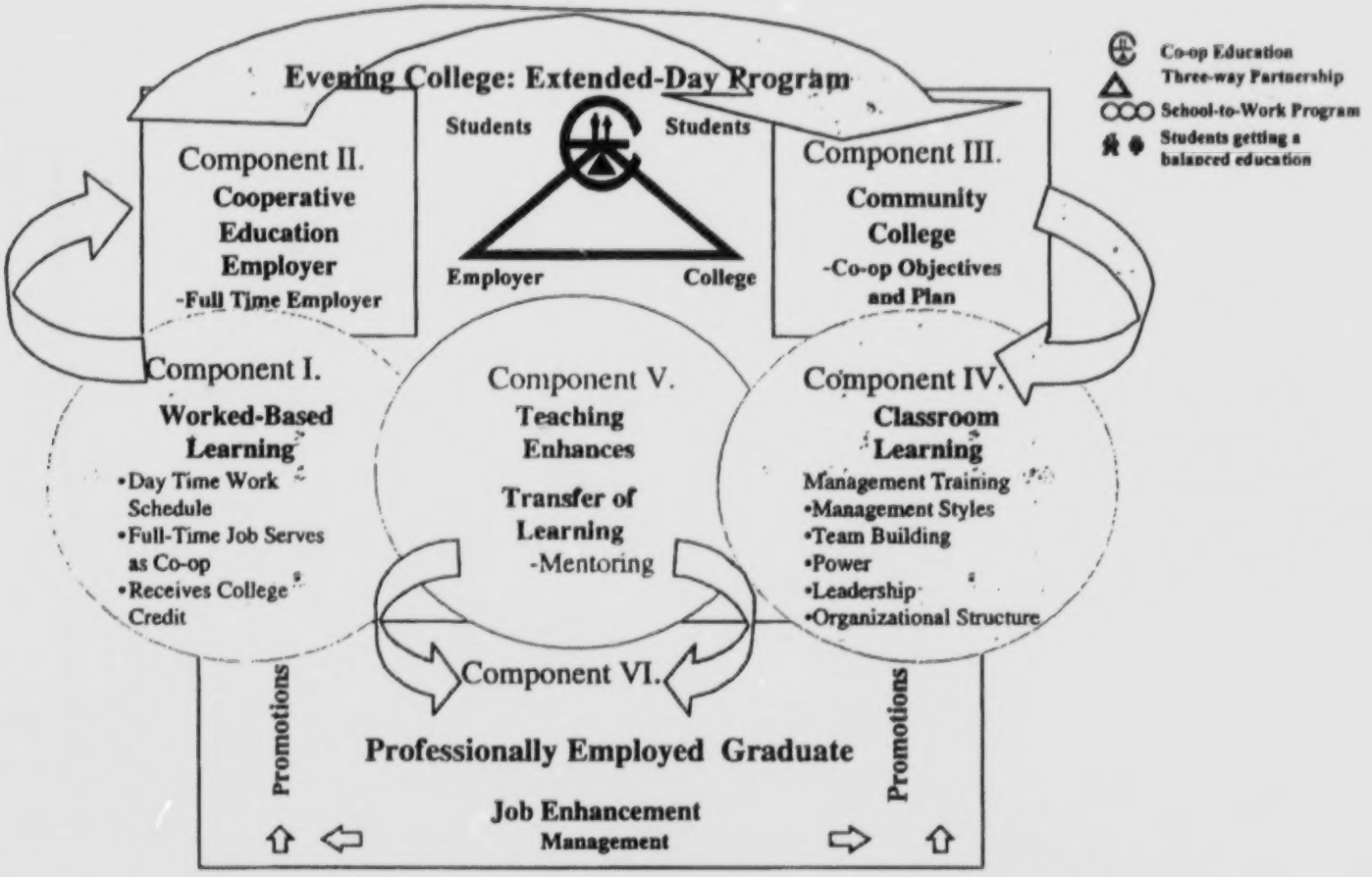

Figure 5.2. Extended Day Program: Evening College co-op education program in practice at Monroe Community College in Rochester, New York - Experiential and Adult Learning - Co-op Adult Program. The full-time job serves as the co-op experience and class work involves a semester-long management related training program.

Synthesized from text: Charner, 1996; Hamilton & Hamilton, 1997; Johnson, 1996; Ricks, 1996; Monroe Community College Co-op Brochure; Tillton Square Community College Co-op Handbook

Data in the present study indicate that, 10 years after graduation from a community college, 87.55% of graduates have completed additional education and 21.5% indicate that employers require them to complete additional education for a salary increase. The community college co-op education office could initiate and coordinate an Employee Exchange Program as a new design in the Extended Day Program.

The Four-year Bound Program

The Four-year Bound Program is a new design for those students who are interested in pursuing a bachelor's degree but who need to remain employed full time (Figure 5.3). This model is also designed for full-time students who want to or who must work part time while taking college transfer classes. The Four-year Bound program would combine co-op education and college transfer. At the present time, college transfer students within the North Carolina Community College System do not have the option of taking co-op education (Pumphrey & Wessels, 1995). This option could be developed and its effect determined through additional research.

The Four-year Bound program could be used as a mechanism within co-op education to encourage co-op students to pursue a bachelor's degree while obtaining job experience related to their career goals. Grubb (1991) suggested at least three substantial reasons for the continued importance of transfer function. First, a strong transfer program is confirmation of the academic purposes of community colleges and strengthens their claims to being colleges. "The ability of students to transfer to four-year colleges and then compete as equals against students who begin in four-year colleges is one test of the acceptability of community colleges within higher education" (Grubb, 1991, p. 195).

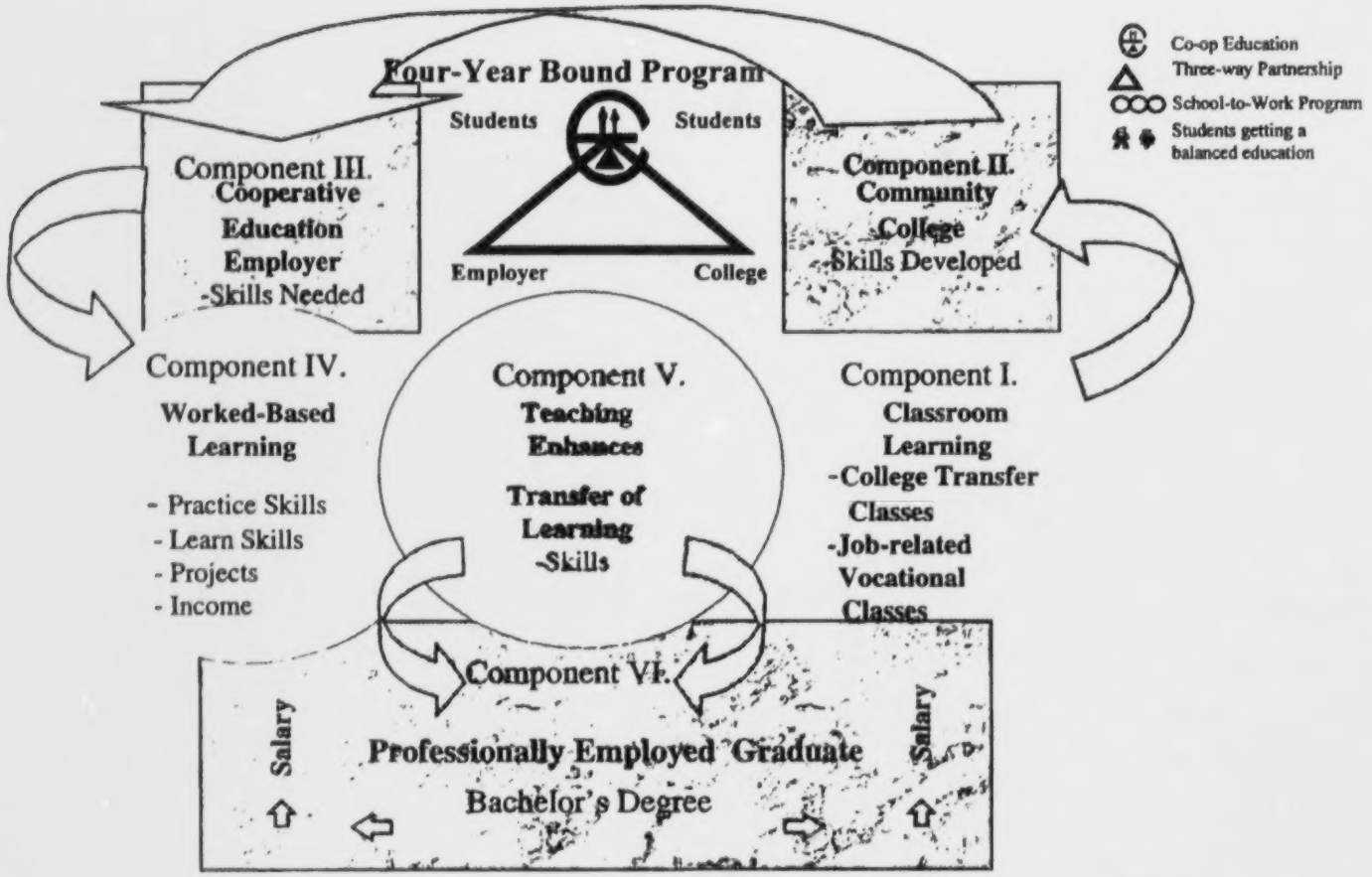

Figure 5.3. Four-year Bound Program: Combines co-op education and the college transfer program to encourage co-op students to pursue the four-year degree while obtaining job-related experience.

Synthesized from text: Charner, 1996; Hamilton & Hamilton, 1997; Johnson, 1996; Ricks, 1996; Tillton Square Community College Co-op Handbook

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Second, despite increasing numbers of non-traditional students, a large number of community college students still aspire to a bachelor of arts degree (Grubb, 1991). Finally, the "claims of community colleges to be egalitarian institutions rest in part on the success of the transfer function" (Grubb, 1991, p. 196). The egalitarian claim depends on transfer and subsequent BA completion being substantial. Unclear is what substantial transfer function might mean; that is, "what proportion of students transferring might be an acceptable level . . ." (Grubb, 1991, p. 196). Yet, Grubb (1991) reported that data examined from 1972 to 1980 showed a decline in transfer rates.

Within the 10-year period since graduation in 1987, 22.8% of the respondents in the present study have completed work-related bachelor's degrees and 2.9% have completed graduate degrees. According to Stern and colleagues (1997), the existing orientation of co-op programs toward employment rather than academic pursuits may "encourage them [co-op graduates] to curtail their education in favor of full-time employment, which could ultimately have a negative effect on their level of earnings" (pp. 226-227). One might speculate that the Four-Year Bound program could help substantiate the National Commission for Cooperative Education's (1994a) assertion that co-op education "promotes the lifelong learning process of integrating work and learning . . . (n.p).

The Bachelor's Plus Program

The Bachelor's Plus Program is another new co-op education model that could be tested based on the co-op model (Figure 5.4) More students with a bachelor's degree who are interested in retraining and updating their skills are now enrolled in community

colleges. Some students want to develop skills but are unable to afford a two-year associate program or a 1-year certificate program, therefore these students want a shorter-term credential.

Thirty percent of community college students already have bachelors' degrees (Hoerner & Wehrley, 1995). Co-op education could serve these students during the evenings and on the weekends. Retraining and updating of skills occurs to a large extent at the work site, as indicated by results in the present study from the 1987 North Carolina Community College System graduates. The most frequent source of work-related additional education was on the job training by a work-site supervisor (52.7%). The next highest source of work-related additional education was on-the-job training by outside contractors (44.4%). Community colleges were the third highest choice for additional education (32.4 %). Co-op coordinators could work with agency staff development officers to help employees redirect their careers and upgrade skills by enrolling in community college classes. The credential most often obtained by the graduates in the present study was the certificate. But only a small portion (7.5%) of these certificates were obtained from the community college.

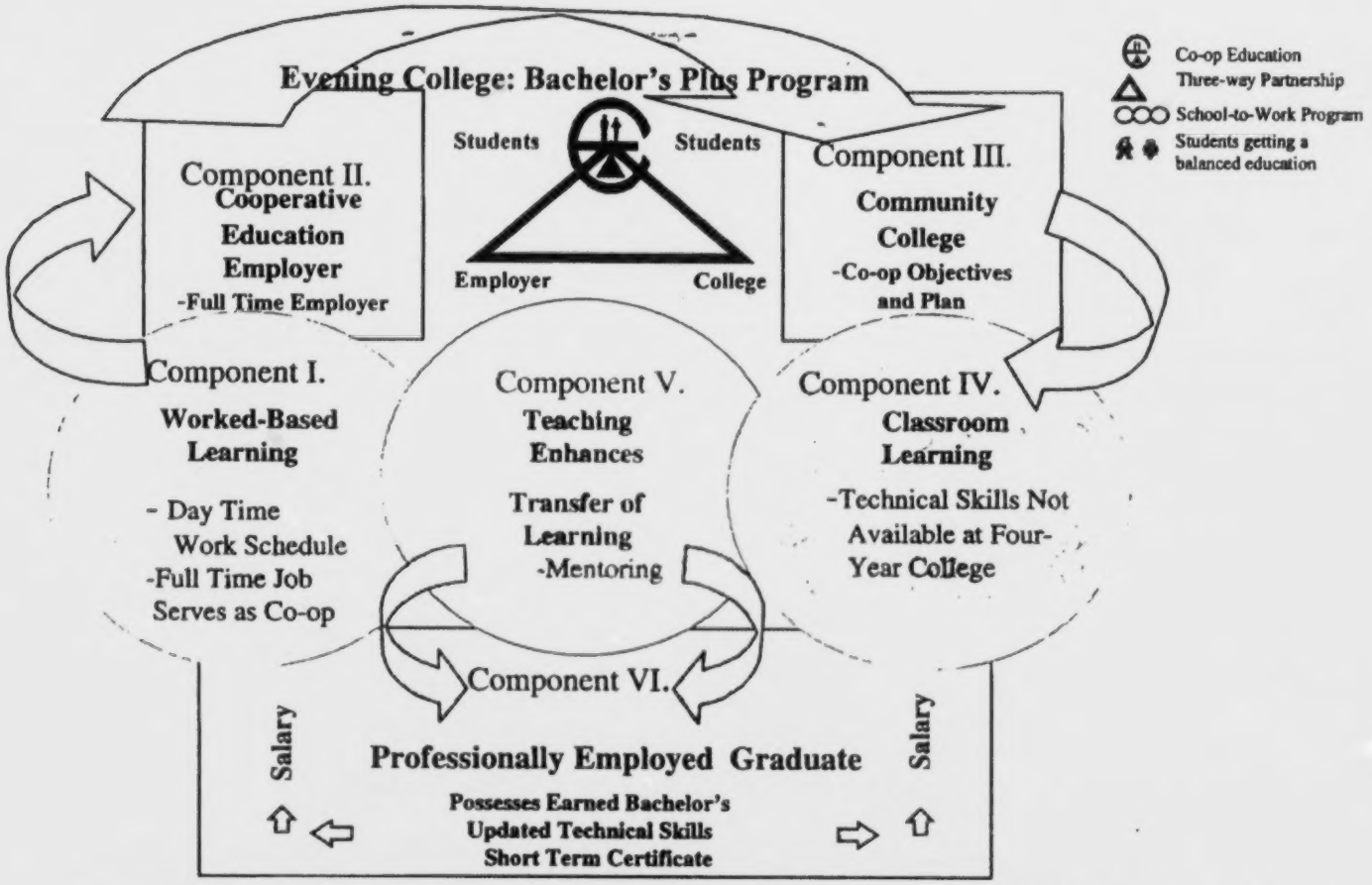

Figure 5.4. Bachelor's Plus Program: Students with earned bachelor's degrees can update technical skills by taking classes not available at four-year colleges. Community college coordinators work with students and employers to design plans best suited for full-time employee.

Synthesized from text: Charner, 1996; Hamilton & Hamilton, 1997; Johnson, 1996; Ricks, 1996; Tillton Square Community College Co-op Handbook

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The Returning Workers Program

The Returning Workers Program, a new design for co-op education, could be tested to determine its effectiveness in addressing the needs of workers who have been out of the workforce and need assistance in returning to the workforce (Figure 5.5). This population of workers might include the injured worker, a disabled worker, a dislocated worker who is the product of downsizing, a female returning to the workforce, a stay-at-home mom, and the displaced homemaker. The Job Training Partnership Act funds much of this training, but co-op education could pick up where JTPA leaves off.

Examples of the Returning Workers Program have been implemented at Western Nevada Community College. These programs include the New Careers for Women, Single Parent, and Displaced Homemaker. Lane Community College (n.d.) has an Injured Worker Retraining Program. Varty (1988) suggested that administrators and practitioners need to determine the program's role, if any, in retraining the current workforce and the individual dislocated by technology. Varty (1988) also asserted that existing co-op programs may be ineffective in meeting the needs of dislocated workers who can benefit from co-op but are unable to afford the alternate or parallel format. Sovilla (1988) believed that the extended day program is the answer for future dislocated workers. Additional research could test the validity of this proposed model.

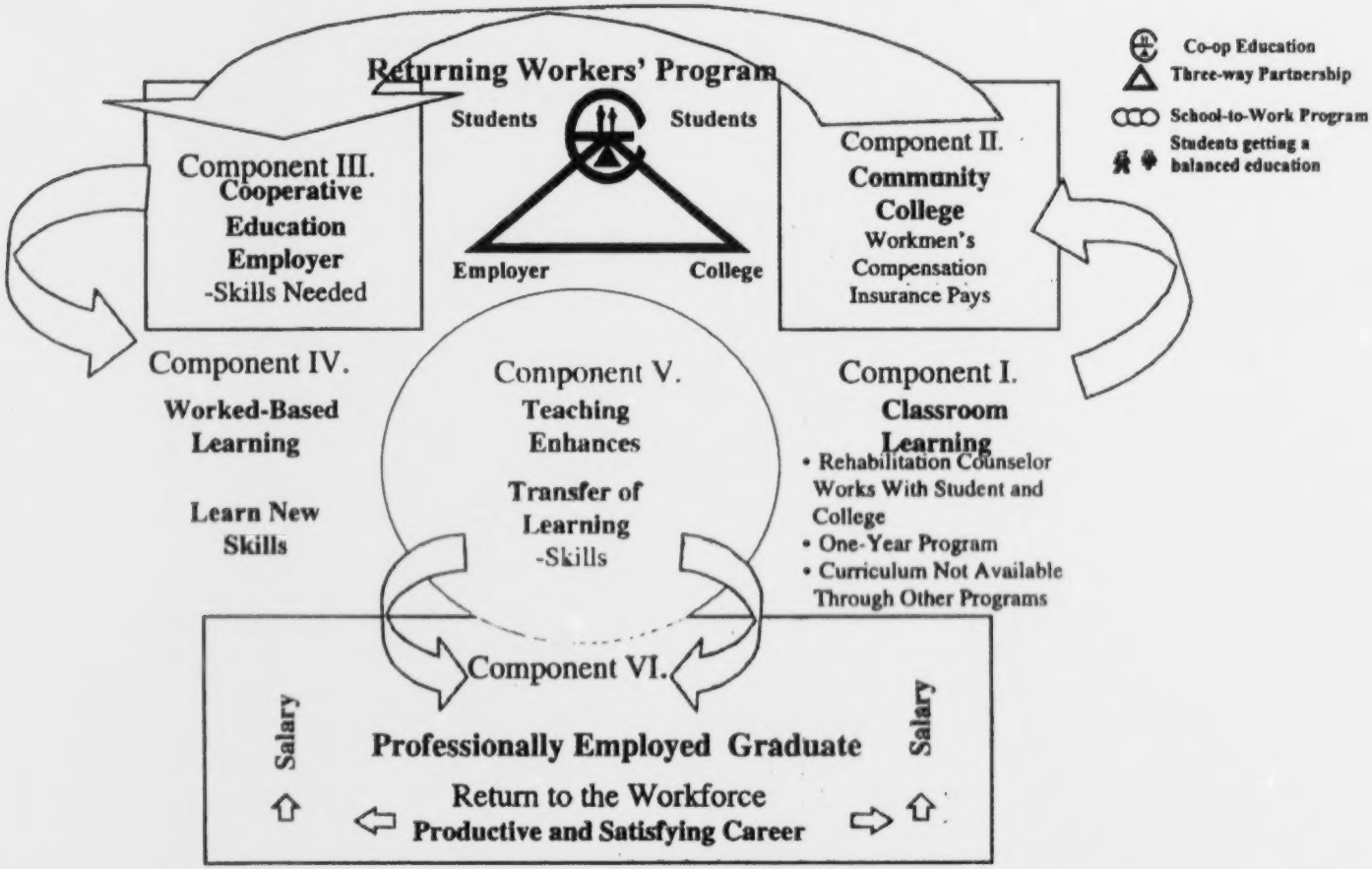

Figure 5.5. Returning Workers' Program: Lane Community College in Eugene, Oregon uses the Injured Worker Program to help students return to the work force. Workers with disabilities, displaced homemakers, and stay at home moms can also participate in similar programs to increase their chances of being hired and receiving higher salaries.

Synthesized from text: Charner, 1996; Hamilton & Hamilton, 1997; Johnson, 1996; Job Training for Injured Workers Brochure; Ricks, 1996; Tillton Square College Co-op Handbook

New Programs for Females

New models of co-op education already in existence that have been designed to address the needs of females need to be promoted to a greater extent inside and outside the co-op education community. Research has shown that females exposed to co-op, directly or indirectly, experience a salary advantage over females who have not been exposed to co-op education. In comparing females within all three groups, Wessels and Pumphery (1996) demonstrated that only the females had a significant difference in salary. The impact of co-op on male salaries in their study was not significant, because males on average have always earned more than females have. The salary advantage demonstrated in 1993 was maintained in 1995 for females having participated in co-op education. Many females were single parents and some took time from their careers for child rearing, which can affect their salaries. However, being female and a graduate of a co-op program increased the hourly wage by 8.6% in 1993, and it jumped to 9.8% in 1995 (Pumphrey & Wessels, 1995), indicating that co-op had a positive effect on their salaries. The present study's results show that during the first year after graduation from a North Carolina Community College and 10 years later, males earn significantly more than females do. Further research is required to test the assumptions of the findings in the present study.

Summary

More programs are needed for the non-traditional community college student who is older, has more job experience, has a family, and needs a way to finance additional schooling. Evening programs are needed because some students are unable to enroll in

the alternate or parallel programs of co-op education because they have full-time jobs. Innovative models of co-op education presented in this study are suggested as new and better ways to educate students and to prepare them for work. These models could be tested to demonstrate their effectiveness in meeting the needs of all community college students, traditional and nontraditional.

The Michigan State Department of Education (1995) established criteria for successful co-op programs, which have been modified slightly in this study to fit new models of co-op for adults. Some features that would enhance the adult co-op program effectiveness are (a) adherence to agreements outlining expectations of the students' college and employers in acquiring specific occupational skill and accomplishing career goals; (b) including mentors both at college and at the work site to guide the co-op students; and (c) establishing more co-op employers who can serve the non-traditional co-op student (older, physically challenged, or displaced worker).

Results from the present study show that, in some instances, a higher percentage of graduates in group 2 (non co-op graduate from a co-op college) demonstrated a greater effect from co-op education than did group 1 and group 3, although the difference was not significant. Loken and Cutt (as cited in Wessels & Pumphrey, 1995, 1996) theorized that the presence of a co-op education program on campus can have a positive effect on some students. Findings in Pumphrey and Wessels' (1995) research support the notion of an institutional effect as opposed to a direct effect. The researchers speculated that (a) having a co-op program gives the faculty greater knowledge of the employers' needs, which they pass on to their students and (b) having a co-op program provides feedback to

faculty members on the quality of learning and to co-op employers on the value of community college co-op graduates.

Additional Research

In this study, the researcher, as have other researchers, "pushed into the unknown to add to our knowledge" of co-op education programs (Hopkins & Antes, 1990, p. 358). Co-op education program evaluations in two-year colleges are "too sparse and too limited to permit firm conclusion or generalization" and "co-op education remains relatively unknown and a very underutilized strategy" (Heinemann, 1988, p. 60).

In light of the paucity of co-op education studies at the community college level, the researcher recommends more study of co-op accountability. The Educational Amendment of 1976 required states to plan frequent and constant evaluation to demonstrate that co-op is good educational practice (Beilby et al., 1980).

The results of several well developed studies could cause educators to change their thinking and alter theories about co-op education. This information might prompt others to develop new hypotheses and to generate new models of co-op education that, in turn, would be tested.

Further investigations are needed that shed light on the findings presented in this study. These investigations should include data generated from existing models that are not widely used, such as the Extended Day Models at LaGuardia Community College in Long Island, New York, Monroe Community College in Rochester, New York, and Prince George's Community College in Largo, Maryland, that assist adult learners by extending operating hours until 8:30 each evening Monday through Thursday. The Prince

George's Community College Co-op staff also visits evening classes both on campus and at other locations to promote the co-op program.

Programs funded by the Job Training Partnership Act, such as New Careers for Women at Western Nevada Community College in Carson City, Nevada, provide women with hands-on instruction in six different traditionally male career areas during a 15-week survey course. Students earn co-op credit for the course. Another one of Western Nevada Community College's programs is for single parents and the displaced homemaker, which is a response to JTPA requirements. The program mandates a semester of unpaid co-op participation.

Lane Community College in Eugene, Oregon, has an Injured Worker Retraining program that enables the staff to develop a course of study around each student's placement, with primary instruction accomplished through co-op education (Lane Community College, n.d.). The displaced worker, who is a product of the high performance workplace, also fits into a special program, such as the Returning Workers Program. A need exists for studies to examine how co-op can address the needs of non-traditional co-op education students (Hutcheson, 1995; Sovilla, 1988; Varty, 1988). In the present study of the 1987 North Carolina Community College System graduates who were between 31 and 40 years of age, 11.7% were unemployed in 1997, with most (9.1%) being retired. Only 2.5% were laid off or looking for employment. Although Laramie County Community College in Cheyenne, Wyoming, does not have a formal program, they have put additional efforts into placing students with disabilities and have been successful with placement and coordination with local service agencies.

Questions remain about salary advantages for co-op education graduates. Wessels and Pumphrey (1996) reported that females co-op graduates demonstrated a salary advantage in 1993 that was maintained in 1995, but that advantage was not shown in results of the present study. Females in their study also demonstrated the institutional effect, which is explained by females not taking part in co-op education also realizing a salary advantage. On the other hand, females from colleges that did not offer co-op did not experience the salary advantage. More study is needed to explain or to confirm those results.

Because co-op graduates did not differ significantly in their pursuit of a bachelor's or higher degree in the current study, further investigation is warranted. Stern and colleagues (1997) suggested that former students in two-year colleges are significantly more likely to attend a four-year college or university if they have a high GPA while in the two-year college, if their parents reportedly hold four-year college degrees, and if the students indicate while in two-year college that they intend to continue at a four-year college. This finding also is worthy of further study.

Differences not found in the present study among co-op groups may have resulted from variability in co-op programs. Perhaps, some of the programs were not true co-ops. Further, community college co-op programs were not the same as university co-op programs. Additional research of these variables may provide useful data for program planners.

The make-up of the community college student population has changed from traditional to non-traditional students. The school-to-work student population has also

changed to include not only the full-time co-op education student but other populations that could be examined or evaluated. These populations include students who (a) leave or graduate from college and seek full-time employment, (b) enter the workforce and enroll in employer supported training, (c) work and go to school at the same time, (d) continue working for several years and then return for post-secondary training, and (e) take part in college programs that integrate school and work despite whether they plan to continue their education or enter the workplace (Charner, 1996, p. iv.).

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APPENDICES

APPENDIX 1

COOPERATIVE EDUCATION PROGRAMS

Table 7.1

Program Descriptions of Cooperative Education Programs in the North Carolina Community College System

Community College/ Location	Administration	Program Type	Participation for Degree	Year Placement Begins	Length of Work Period	Number of Work Periods	Percentage of Paid Placements
Alamance Community College/ Graham	Decentralized	Alternating/ Parallel	Mandatory/ Optional	Freshman	1 Quarter -10, 20, 30, 40 hrs./week	7 Quarters maximum 2 Quarters minimum	75%
Cape Fear Community College/ Wilmington	Centralized	NA	Optional	Sophomore	11 Weeks	6 maximum 1 minimum	80%
Central Piedmont Community College/ Charlotte	Centralized/ Decentralized	Alternating/ Parallel	Mandatory/ Optional	Freshman/ Sophomore	11 Weeks	4 maximum 1 minimum	82%
College of the Albemarle/ Elizabeth City	Centralized	Parallel	Optional	Freshman	11 Weeks	6 maximum	100%

Community College/ Location	Administration	Program Type	Participation for Degree	Year Placement Begins	Length of Work Period	Number of Work Periods	Percentage of Paid Placements
Craven Community College/ New Bern	Centralized/ Decentralized	Alternating/ Parallel	Optional	Freshman	3 Months	6 Maximum 2 Minimum	100%
Fayetteville Technical Community College/ Fayetteville	Centralized	Parallel	Optional	Freshman	11 Weeks	3 Maximum 2 Minimum	100%
Gaston College/ Dallas	Centralized	Alternating/ Parallel	Optional	Freshman	11 Weeks	NA	100%
Haywood Community College/ Clyde	Centralized	Alternating/ Parallel	Optional	Freshman	11Weeks	3 Maximum 1 Minimum	95%
Isothermal Community College/ Spindale	Centralized	Parallel	NA	Freshman	11 Weeks	6 Maximum 1 Minimum	100%
Lenoir Community College/ Kinston	Centralized	Parallel	Optional	Freshman	11 Weeks	7 Maximum 1 Minimum	100%

Community College/ Location	Administration	Program Type	Participation for Degree	Year Placement Begins	Length of Work Period	Number of Work Periods	Percentage of Paid Placements
Mitchell Community College/ Charlotte	Centralized	Alternating/ Parallel	Optional	Freshman/ Sophomore	13 Weeks	6 Maximum 1 Minimum	100%
Pitt Community College/ Greenville	Centralized	Alternating/ Parallel	Mandatory/ Optional	Freshman/ Sophomore	11 Weeks	3 Maximum 1 Minimum	90%
Richmond Community College/ Hamlet	NA	Parallel	Optional	NA	13 Weeks	3 Maximum 2 Minimum	100%
Stanly Community/ Albemarle	Centralized	Parallel	Optional	Sophomore	11 Weeks	4 Maximum 2 Minimum	95%
Surry Community College/ Dobson	Centralized	Parallel	Optional	Freshman/ Sophomore	11 Weeks	4 Maximum 1 Minimum	100%
Tillton Square Community College/ Tillton	Centralized	Alternating/ Parallel	Optional	Sophomore	3 Months	4 Maximum 1 Minimum	100%

Community College/ Location	Administration	Program Type	Participation for Degree	Year Placement Begins	Length of Work Period	Number of Work Periods	Percentage of Paid Placements
Wayne Community College/ Goldsboro	Decentralized	Alternating/ Parallel	Mandatory/ Optional	Freshman	11 Weeks	5 Maximum 2 Minimum	100%
Wilkes Community College/ Wilkesboro	Centralized/ Decentralized	Parallel	Mandatory/ Optional	Freshman	11 Weeks	6 Maximum	85%

Note. Hutcheson, P. (Ed.) (1996). *Directory of college cooperative education programs.* Phoenix, AZ: Oryx Press, 105-113.

APPENDIX 2

POSTCARD AND LETTERS

Dear Participant:

You have been part of a follow-op study of 1987 North Carolina Community College System graduates and have become a vital part of research data that has been generated since 1993.

This card has been sent to verify your name and address and if corrections are necessary, please return to the address given. Within a few weeks you will receive your survey in the mail. Please help to support the research that is being conducted by NC State University, Raleigh, NC, by completing and returning the survey once you receive it. Thank you.

Return corrected address card to:
Ms. Lillian Johnson, NC State University
College of Education & Psychology
Department of Adult & Community
College Education, Box 7801
Raleigh, NC 27695-7801

June 30, 1998

«FirstName»«LastName»
«Address1»
«Address2»
«City» «State» «PostalCode»

Dear «FirstName»:

Since graduating in 1987 from a community college located in the state of North Carolina, you have become a very important product of our educational system. You were part of a research investigation that was conducted in 1993 and 1995 and because you have participated in the past, it is hoped that you will provide the needed information again. You have been selected from a pool of about 3,000 graduates. The screened number of participants was slightly over 1,500 participants and over the years, that number has decreased to approximately 1,000 because many graduates have moved.

You possess information that can help administrators and faculty to anticipate the educational needs of graduates several years after graduation. Information that you supply can be used to make decisions concerning the implementation of college transfer classes, possibility of offering applied bachelor's degrees, ways to help employers provide for employee retraining, ways to make students aware of the salary levels that they may expect after graduation, and contributions of the cooperative education program to its participants and the North Carolina Community College System.

This research project is funded by the National Alliance of Community and Technical Colleges, National Initiative for Leadership and Institutional Effectiveness (NILIE), and the North Carolina Community College System. The mailing list and original instrument are the property of the North Carolina Community College System which, seeks to maintain complete anonymity for participants.

We are depending on you to be the voice of the class of 1987. In order that the North Carolina Community College System will receive the results of this research by the fall of 1998, it is important that you complete this request for information and mail the forms by **July 14, 1998** or shortly thereafter. We thank you for your cooperation in advance.

Sincerely,

George A. Baker III
Joseph D. Moore Distinguished Professor
of Community College Leadership
Director, NILIE
Executive Director, National Alliance
of Community and Technical Colleges

Lillian Johnson
Managing Director
National Alliance of
Community and Technical Colleges

November 16, 1998

Dear Participant:

In June of this year you were mailed a request for information, *North Carolina Community College System Graduates' Additional Education and Employment Experiences*. If you have already responded to our earlier request for information, we thank you for your cooperation and ask that you disregard this letter.

If you no longer want your name to remain on this mailing list, please drop the enclosed postcard in the mail. We will honor your request and you will not receive another packet from our office. If you choose to respond to the request for information, please do so by December 15, 1998. We thank you in advance for your cooperation.

Sincerely,

George A. Baker III
Joseph D. Moore Distinguished Professor
of Community College Leadership
Director, NILIE
Executive Director, National Alliance
of Community and Technical Colleges

Lillian Johnson
Instructor
Industrial Pharmaceutical Technology
Tillton Square Community College

Enclosures

APPENDIX 3

North Carolina
Community College System
Graduates'
Additional Education and
Employment Experiences

You have been selected from a pool of 1987 associate's degree graduates of the North Carolina Community College System to provide vital information concerning additional education and employment acquired by graduates at least ten years after graduation.

Information supplied by you will be kept in strict confidence.

General Instructions: Answer the questions by darkening the corresponding circles on the answer sheet provided by using a #2 pencil. Do Not Fold or Bend Form. When you have completed this survey, please seal it in the prepaid envelope provided and return it to:

Ms. Lillian Johnson
NC State University, College of Education and Psychology
Department of Adult and Community College Education
300 Poe Hall, Box 7801
Raleigh, NC 27695-7801
Telephone: (919)515-4244

1987 North Carolina Community College System Graduates' Additional Education and Employment Experiences

Directions: Darken the circles on the answer sheet to indicate your response. Yes =A and No =B

Additional Education

	Yes	No
1. Are you **currently** enrolled in an institution or agency where you are receiving additional training that is **work related**? [If no, go to Question 10].	A	B
If you are currently enrolled in an institution or agency where you are receiving additional training that is work related, darken all that apply.		
2. On the job training (provided by work site supervisor)	A	
3. On the job training (provided by outside contractors, community college, etc.)	A	
4. Business, technical, proprietary school	A	
5. Community colleges	A	
6. Junior colleges	A	
7. Four-year colleges	A	
8. Military service	A	
9. Other (satellite courses, correspondence courses, etc.)	A	
10. Have you **completed** additional education that was **work related** since you graduated from your community college in 1987?	Yes A	No B
What were the sources of the training that you have **completed**? Darken all that apply.		
11. On the job training (work site supervisor)	A	
12. On the job training (outside contractor)	A	
13. Business, technical, proprietary school	A	
14. Community colleges	A	
15. Junior colleges	A	
16. Four-year colleges	A	
17. Military service	A	
18. Other	A	
Indicate the credential that you have received, if any, since graduation in 1987. Darken all that apply.		
19. None	A	
20. Certificate	A	
21. Associate's degree	A	
22. Bachelor's degree	A	
23. Graduate degree	A	
What factors influenced you to seek additional education (completed or uncompleted)? Darken all that apply.		
24. College faculty/staff or other educators	A	
25. Other employees	A	
26. Employers	A	
27. Relatives	A	
28. Spouse	A	
29. Circumstances (such as new job opening, etc.)	A	
30. Since graduation from your community college in 1987, have you completed any training that was **unrelated to work**?	Yes A	No B
31. Does your present job or did a previous job require a professional license or certificate?	A	B
32. Is additional education required by your present or former employer in order for you to receive an increase in pay?	A	B

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Employment

Directions: Darken the circles on the answer sheet to indicate your response. Yes = A and No = B

	Yes	No
33. Are you currently **employed**? [If **unemployed**, go Question 40.]	A	B
34. If currently **employed**, is your current job (main source of employment) considered full-time?	A	B
If currently employed, darken one only		
35. Self-Employed	A	
36. Employed but not self-employed	A	
37. Full-time military	A	
38. Full-time student and employed	A	
39. Full-time student and unemployed	A	
If currently unemployed, darken all circles that apply to indicate status.		
40. Retired	A	
41. Between jobs (laid off)	A	
42. Looking for employment	A	

Please indicate your income range for 1997 and 1987, or when last employed full-time, by darkening the appropriate circles. Income includes gross salary from main source of income for you and not from your family.

Indicate your income for the year 1997 (**items 43-45**) and then 1987 (**items 46-48**).

1997	1987
43. A. Less than 15,000 B. 15,001 to 20,000 C. 20,001 to 25,000 D. 25,001 to 30,000 E. 30,001 to 35,000	46. A. Less than 15,000 B. 15,001 to 20,000 C. 20,001 to 25,000 D. 25,001 to 30,000 E. 30,001 to 35,000
44. A. 35,001 to 40,000 B. 40,001 to 45,000 C. 45,001 to 50,000 D. 50,001 to 55,000 E. 55,001 to 60,000	47. A. 35,001 to 40,000 B. 40,001 to 45,000 C. 45,001 to 50,000 D. 50,001 to 55,000 E. 55,001 to 60,000
45. A. 60,001 to 65,000 B. 65,001 to 70,000 C. 70,001 to 75,000 D. 75,001 to 80,000 E. More than 80,000	48. A. 60,001 to 65,000 B. 65,001 to 70,000 C. 70,001 to 75,000 D. 75,001 to 80,000 E. More than 80,000

Cooperative Education Graduates Only

Directions: Darken the circles on the answer sheet to indicate your response. Yes =A and No = B

	Yes	No
49. Did you participate in a cooperative education program prior to graduation in 1987? [If not, go to Question 53.]	A	B
50. Were you encouraged by your cooperative education employer to continue your education beyond the associate's degree?	A	B
51. Were you employed full-time by your cooperative education employer immediately after graduation in 1987?	A	B
52. Are you now employed full-time by your cooperative education employer?	A	B

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Demographic Information

Directions: Darken the circles on the answer sheet to indicate your response. Yes=A and No=B

	Yes
What is your age?	
53. 30 or under	A
54. 31 to 40	A
55. 41 to 50	A
56. 51 to 59	A
57. 60 or more	A
What is your gender?	
58. Female	A
59. Male	A
With what ethnic group do you identify?	
60. African-American	A
61. Alaskan Native/American Indian	A
62. Asian-American/Pacific Islander	A
63. Caucasian	A
64. Hispanic	A
65. Other	A

Thank you so much for your cooperation. Please submit comments concerning questions asked, arrangement of questions, and the possible choices for responses.

_____

_____

_____

_____

_____

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